

## Reciprocal rights allow Soviet ships in Faroe waters

AN AGREEMENT hardly likely to please EEC bureaucrats in Brussels has been reached between the Soviet Union and Faroe Islands. Although linked to Denmark, an EEC member, Faroe is not governed by the Community's policies. It has therefore been able to negotiate a reciprocal arrangement with the USSR by which Russian ships will be able to work inside Faroese limits, while Faroe

trawlers will be allowed into the Barents Sea.

USSR Fisheries Minister Alexander Ishkov visited Faroe to negotiate the agreement, which he said, "rested on the principle of respect for sovereignty and mutual benefit."

"Soviet and Faroese fishermen have been operating for years in the same grounds and we have much to learn from

one another. Each side has gained considerable experience in improving fishing techniques in the North Atlantic and in fish processing.

Faroe has also agreed reciprocal quotas for 1978 with Norway. In Norwegian waters north of the 62nd

We also share an interest in developing research into fish resources in waters adjacent to our coasts."

parallel, Faroe boats will be allowed to take 12 000 tons of demersal fish; and Norwegian boats will be allowed a similar amount from Faroe waters.

South of 62 deg., Faroe fishermen will be allowed 15 000 tons of mackerel and an unlimited amount of Norway pout and sandeels. Norwegian fishermen will be allowed an unlimited haul of blue whiting in Faroe waters.

## NEWS IN BRIEF

● **MACKEREL** landings in Norway for human consumption were a record 45 000 tons in 1977. This is 10 000 tons more than in 1976. The quality of the mackerel is described as good. A large proportion of the catch was exported, chiefly to Nigeria and West Germany.

● **BRITAIN'S** "RFD" Group, maker of inflatable life rafts, has acquired a 55 per cent share in an American life raft company, Res-Q-Raft of Lake Worth, Florida. The American firm is to be renamed RFD Patten Inc.

● **GARDEN** Reach Ship-builders and Engineers Ltd. of Calcutta (owned by the Indian Ministry of Defence) is to collaborate with a private firm, Hindcock Engineering Company of Calcutta, to build trawlers in West Bengal state.

● **URUGUAY'S** fish catch has more than trebled between 1967 and 1976. Work is now in progress at Montevideo and will cost about \$5 million. There is also a long-term plan to develop the port of La Paloma up to an eventual yearly capacity of 300 000 tons.

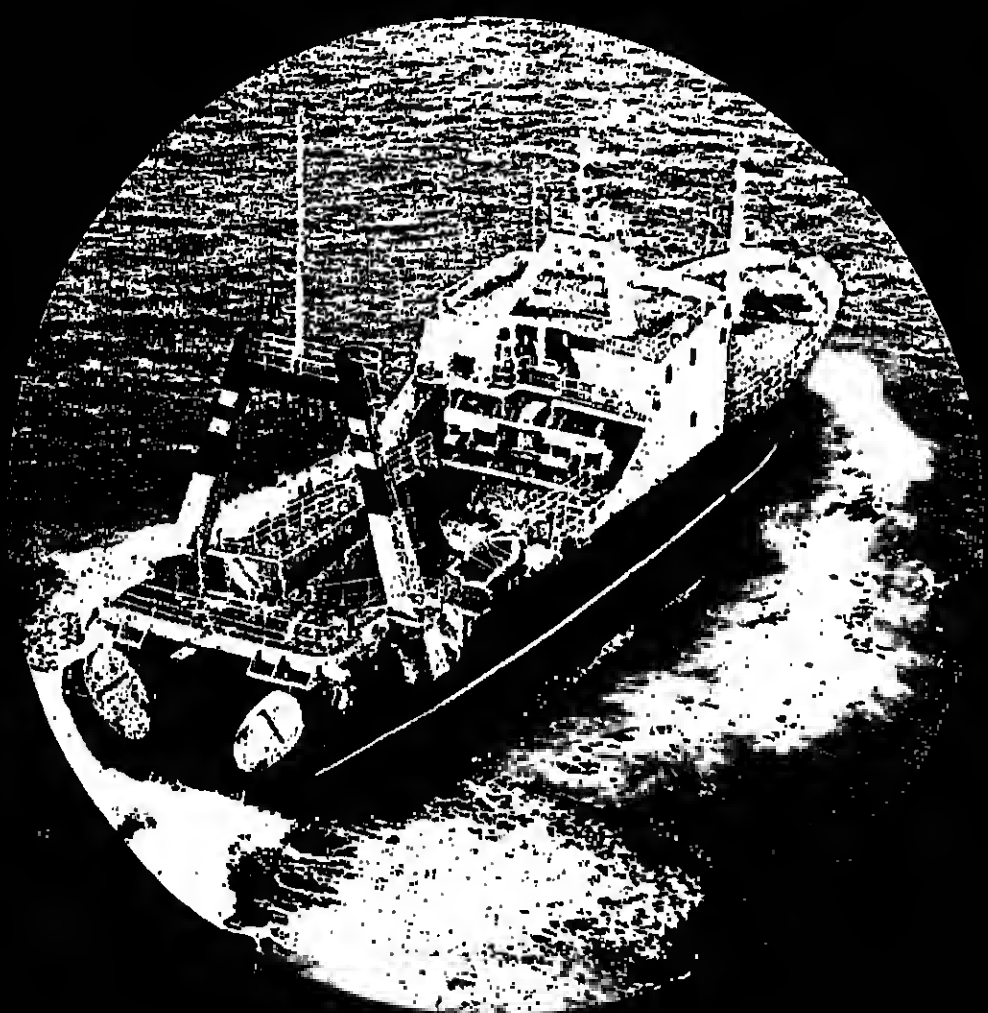
● A **SHARP** decline in the sardine catch last year caused serious problems for Morocco's canneries. Only about 1.3 million cases were packed, compared with 2.5m. in 1976 and 2.6m. in an average year. Factories had to resort to buying frozen sardines, in particular from Polish ships.

● A **YARD** in Kaliningrad, USSR, is building a fishing catamaran. It will be worked by a crew of 13 in lakes, bays and inshore waters. It will be able to process and freeze. To be completed in 1978, the boat will be the first of a series.

● A **FISH FARM** near Vladivostok in the Soviet Far East is sending live Kamchatka crabs in special containers by rail to Murmansk. The crabs are being released into the Barents Sea.

● **THE** Trondheim firm Prosjekttering A/S is to plan a fishing port in South Yemen. The project is financed by the World Bank and is on behalf of FAO.

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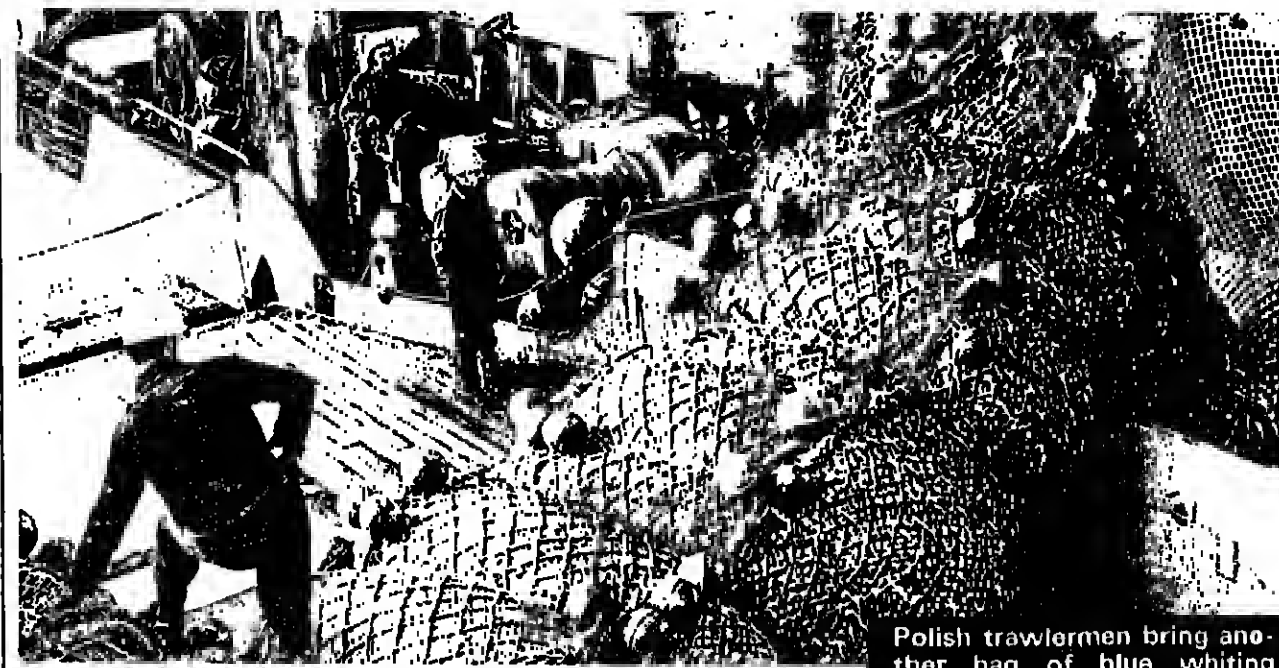
# fishing news

February 1978 Vol 17 No. 2

75p monthly

PROTECTIVE CLOTHING FROM

- Australia goes to 200 miles — Page 7.
- New hopes for Peru's anchovy — Page 7.
- Fishing vessel safety rules — Page 10.
- Limits talks in New Zealand — Page 16.
- Antarctic salmon ranching — Page 18.
- Future of the krill fishery — Page 24.
- US akipers train in Britain — Page 32.



Polish trawlersmen bring another bag of blue whiting aboard the Dalmat factory trawler "Neptun". Difficult to process, blue whiting is being test fished by several European countries. This month we describe successful tests in the "Neptun" of a new processing machine developed in Norway. See Page 36.

## INDIA'S MOGULS MOVE IN

INDIA has taken a major policy decision to permit three large industrial concerns to diversify into deepsea fishing. They are Tatas of Bombay, Chowgules of Goa and the multi-national company, Kelvinator. Two other new companies are being allowed by the government to establish joint ventures, one with Nigerian and the other with Bulgarian partners.

In each of the joint ventures, reports *FN* correspondent Trevor Driberg, the foreign share is restricted to 40 per cent. Guidelines laid down by the

Ministry of Agriculture will confine all these ventures to areas where they do not compete with small, traditional fishing operations.

The companies will not be allowed to import conventional small trawlers but they will be able to bring in refrigerated ships for processing fish at sea. Kelvinator are reported to have come to an agreement with a Polish concern under which it will bring in such ships from Poland. The joint ventures with Nigeria and Bulgaria are also expected to involve factory ships.

Tatas propose to charter 25 ships from Taiwan for six months. Their catches will be landed and processed in a cannery to be set up on the Andaman Islands. Tatas plan later to import their own ships.

### Sponsored

Chowgules plan to import a lobster vessel to catch and process for export markets.

The Indo-Nigerian venture is being sponsored by a group of Indian businessmen based in Nigeria. A British firm in Nigeria is to provide assistance.

Over the current fiscal year, the government has decided to allow foreign exchange for importing 75 small trawlers.

Earlier it had considered 260 separate applications for permission to import.

## EEC fishing deadlock

EEC TALKS on fisheries policy failed to reach the hoped-for decision last week when the British were unable to agree with the eight other members.

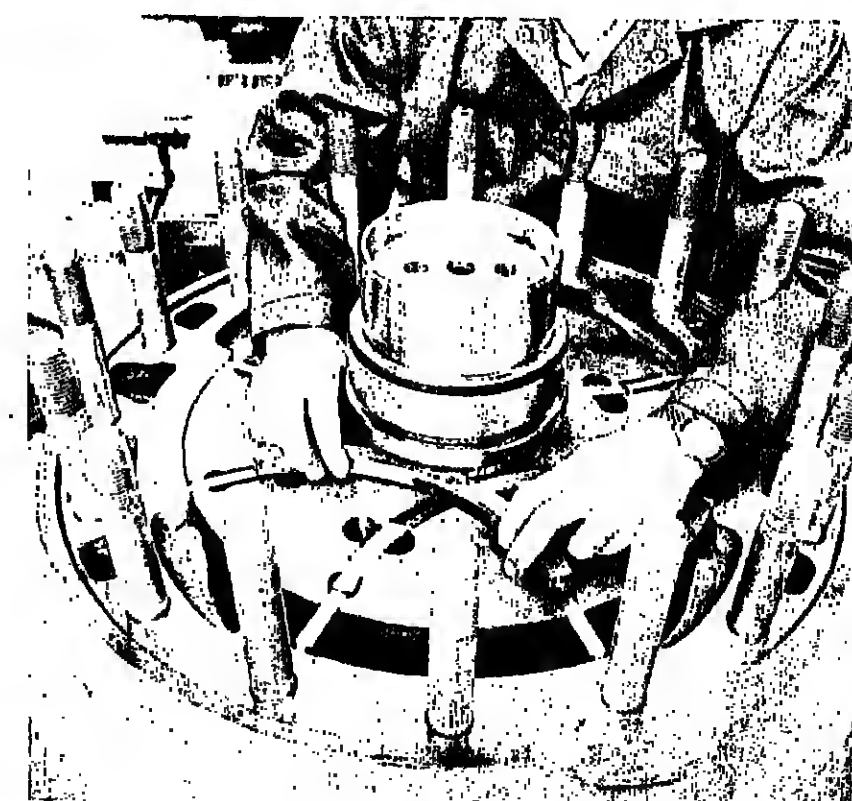
Sticking points in the discussion included allocations of catch 1100 little for us, said the British, and the question of fishing rights inside 12 miles.

### Total disaster

Agreement over the proposed revised policy would have "meant total disaster for the British industry," said Minister John Silkin. But the failure in Brussels has, in the view of the West German Minister Josef Ertl, plunged the EEC's fishing policy into "a state of crisis."

Negotiations with third countries will have to be carried out without the cohesion of an agreed fisheries policy. For details of the EEC proposals and the talks during January leading up to last week's debacle, see Pages 12 and 13.

Fishing within the EEC—turn to page 12



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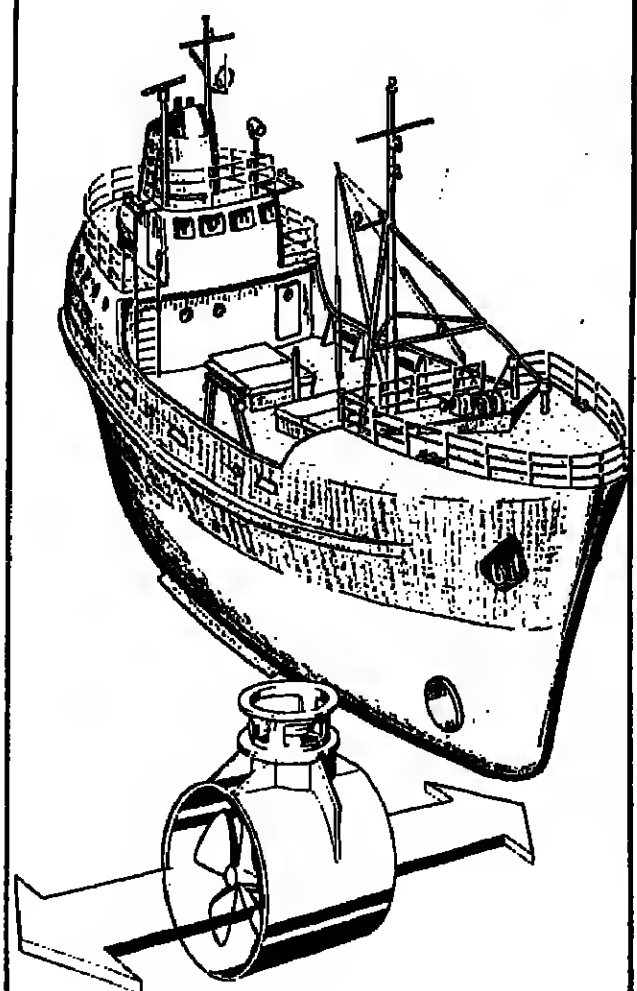
## Death of the 'Conqueror'



HEELED OVER with her hull now battered on the rocks by winter storms, the 71 metre long freezer trawler 'Conqueror' has been abandoned at Mousehole, near Penzance in Cornwall. The £1 million, 12-year-old British freezer was engaged in meckrel fishing when she ran aground in December. Movement over the rocks as she was battered by wind and waves has damaged the ship so badly that she has been abandoned.



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### Arab meal plant may close

CATCHES far below those estimated in a survey may make it impossible to keep operating a Norwegian-supplied fish meal plant in Ras al-Khaimah in the United Arab Emirates.

The meal plant project was carried out for the Ras al-Khaimah Fish Company by the organisation Fideco.

Behind the expected failure of the project is a pattern of events becoming increasingly familiar in the Middle East.

According to Fideco a feasibility study carried out by another organisation overestimated the potential catch.

## Australia plans for 200 miles

THE VAST coastline of Australia will soon be surrounded by 200-mile fishing waters. Legislation giving effect to this will be introduced early in the first session of the new Parliament which opens on February 21.

This will be a fishing zone rather than an exclusive economic zone. The implications of it have been studied by a Fisheries Council made up of federal and state ministers responsible for fisheries.

The group has prepared a comprehensive report on the size and the condition of stocks within the 200 miles. It has also looked into the extent and future capacity of the Australian industry to exploit these stocks.

Considered as well have been the problems of management and of assessing total allowable catch, and the surplus that might be available to other nations.

### HALIBUT CUT

THE United States-Canadian halibut catch has been set at 20 million lb. for 1978, two million lb. less than in 1977. This was decided by the International Pacific Halibut Commission (IPIHC) on January 27 at the end of its annual meeting in Seattle.

While abundance of adult and juvenile halibut improved slightly in 1977, the Commission reported that stocks were still below their optimum level.

## Abalone price slump

THE end of 1977 saw a further deterioration in the already depressed world market for abalone, reports our correspondent in Australia.

Prices on the major markets in Japan and Hong Kong slumped to such an extent that almost all Australian abalone processors stopped handling the species.

Until 1976, Australia was the largest exporter of abalone to Japan. That year she shipped 714 tons, worth

over \$4.5 million.

But in 1977 large quantities of cheaper Chilean 'abalone' came on to the Japanese market. This new source of supply, plus accumulation of stocks in Japan, caused a price slide.

The Chilean abalone (called loco) is similar in size and shape to abalone, but its behaviour and life history is quite different. It is a large marine snail of the family Muricidae, of which there is only one species.



An Australian abalone catcher — earnings hit hard.

# FISH TALKS SWING TO NORWAY

## Canada boats set for herring rush

WITH THE breakdown last week of EEC fishery policy talks, the European focus swings back to Norway.

On January 31, Norway's Law of the Sea Minister Jens Evensen began a tour of European capitals — in particular Bonn, Brussels and Paris — to discuss proposals for a fisheries protection zone around Svalbard (Spitzbergen).

North Sea catch quotas are also likely to be discussed. Problems over these quotas were exacerbated late last month when the EEC proposed raising the quota for saithe to 230,000 tons. Of this, 152,000 tons would be reserved for EEC fishermen.

In November 1977, following negotiations, the saithe quota was agreed at 200,000 tons. The EEC wanted 110,000 tons but Norway urged that it cut back to 95,000 tons.

Faced with the new demands on North Sea stocks, Norway has informed EEC countries and the Commission in Brussels that she is not satisfied with the new proposals.

Her view is that quotas for species such as saithe can only be fixed by close consultation. Norwegians claim that most of the saithe stock in the North Sea is in their area.



### A new round of talks for Law of the Sea Minister Jens Evensen

Also being raised is the concept of "balanced fishing" which is likely to arouse as much opposition from EEC countries as the British concept of "dominant preferences."

The Norwegians allege that they lose more than they get in distribution of North Sea catches, and they want the balance made up.

The implication is that EEC countries will have to reduce catches quite considerably

over the next two or three years.

In 1977, reports the Oslo newspaper *Aftenposten*, the Norwegian haul from the EEC part of the North Sea had dropped to 125,000 tons, compared with 320,000 tons the year before and a yearly average in 1972/73 of 400,000 tons.

Balanced fishing is certain to feature in Norway-EEC talks which were to begin on January 27 but were postponed to February 7 in expectation of final accord over fisheries policy between EEC members.

Without this accord, the situation could become even more confused.

Norwegian quotas for the EEC inside her 200-mile zone are temporary and last only for the first quarter of 1978.

North of the 62nd parallel, EEC fishermen are allowed 12,000 tons of Norwegian Arctic cod, 2,000 tons of haddock, 2,000 tons of redfish, 4,000 tons of saithe, 350 tons of Greenland halibut, and 1,000 tons of other fish.

ON MARCH 1, some 200 Canadian boats will head out into the still-turbulent winter seas to take part in the British Columbia herring roe fishery.

The quota this year has been set at 80,000 tons, reports *FNI* correspondent Les Rimes.

With the harvest restricted, boats that are in the right place will be getting fish. Some areas may be open for catching for as little as 15 minutes.

Fishing is by purse seines and most of it will take place off the west coast of Vancouver Island. The north coast will also be open.

Almost all the herring roe will go to Japan where it is considered a delicacy.

Because of the quota limit, there has been a tendency for some boats to overload.

Others with inadequate navigational aids have ventured out at night to be caught in storms.

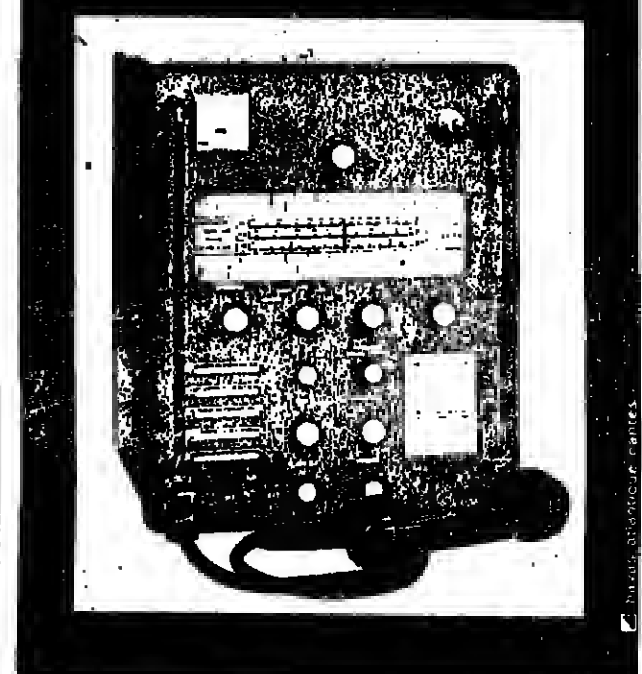
Three years ago 16 boats capsized and 14 fishermen died. In 1975 four lives were lost.

## North Sea pair trials

THE Norwegian Fishery Directorate in Bergen is to sponsor pair trawling trials for saithe and cod in the North Sea. They will take place from the old Viking Bank north between March 13 and April 22.

To entry out the trials the Directorate has been looking to charter a relatively new vessel about 100ft. (30.5 metres) long.

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## Seized boats sold

SEVEN TAIWANESE fishing vessels confiscated by the Australian government for fishing inside 12-mile limits in northern Australia have been sold by public tender to foreign owners.

Three steel gillnetters between 90 and 120ft. long and built between 1966 and 1969 went for \$A9,000 to \$A12,000 each to Australian buyers for export to Taiwan.

Two other gillnetters built in 1971 were sold to Singapore buyers for \$A15,000 each. A steel 90ft. long stern trawler built in 1974 was sold to a New Zealand company for \$A65,000 and a sister ship to Cyprus for \$A35,000.

Since 1969 Australia has confiscated 45 Taiwanese vessels for illegal fishing.

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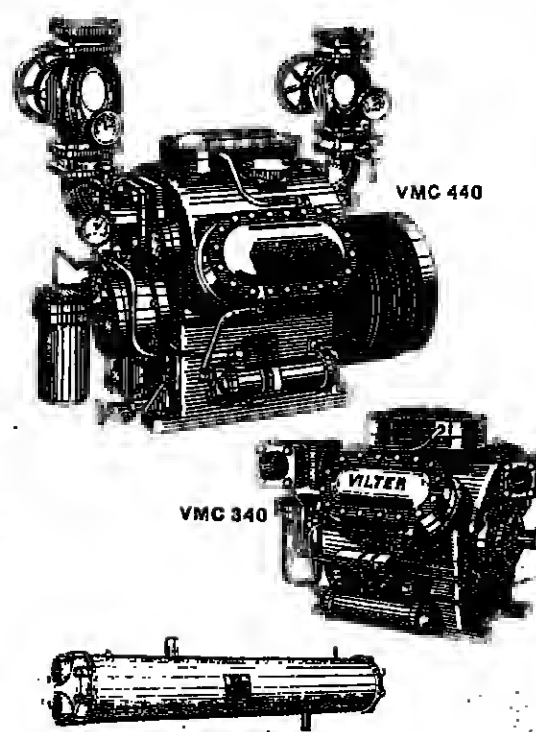
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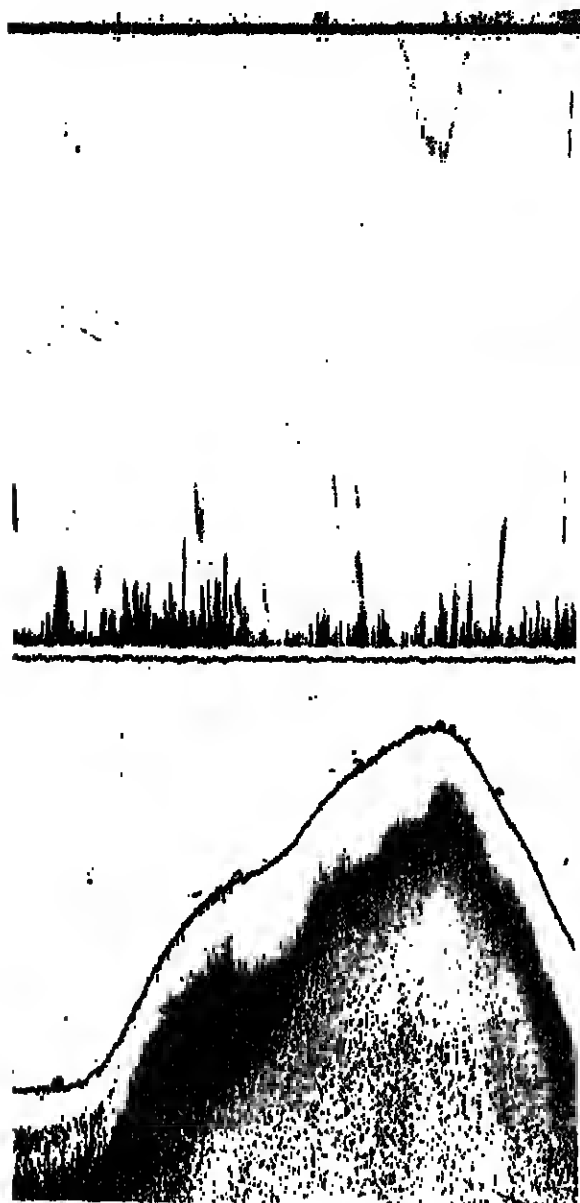
## Nor-Fishing '78

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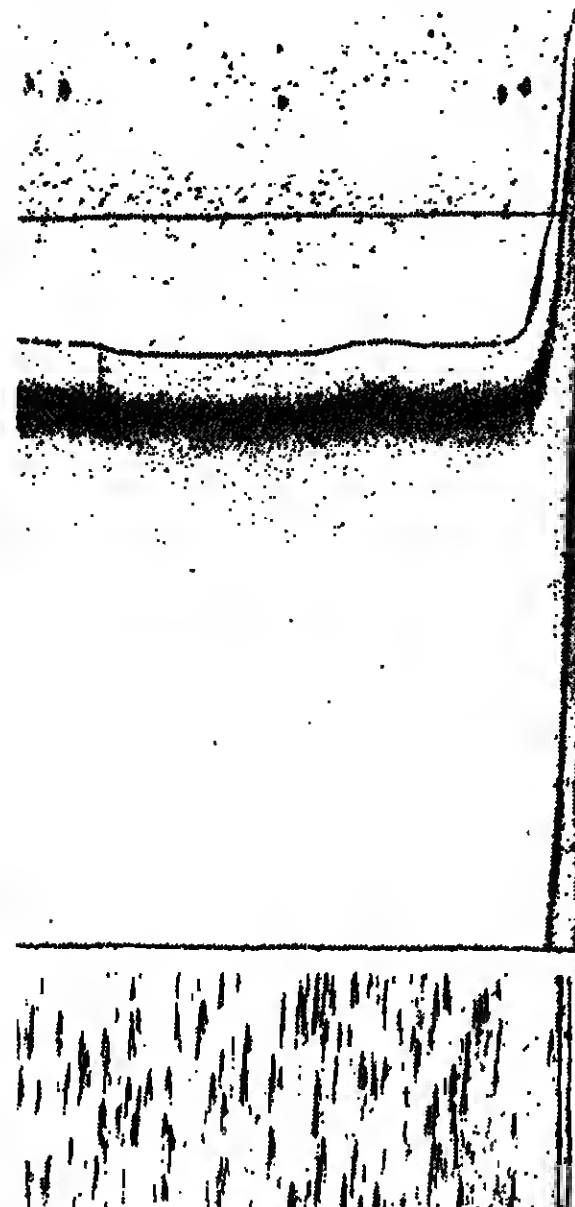
For the 7th time we welcome exhibitors to the international fisheries fair — Nor-Fishing '78 — which will now be presented in Norway's biggest exhibition hall The Sjølyst Centre, Oslo. Your early stand-reservation is urgently requested. For further information, please contact: Norges Varemesse (The Norwegian Fair Organization), P.O. Box 130 Skøyen, Oslo 2, Norway. Tel. (02) 55 37 90. Telex 18748 messe n.



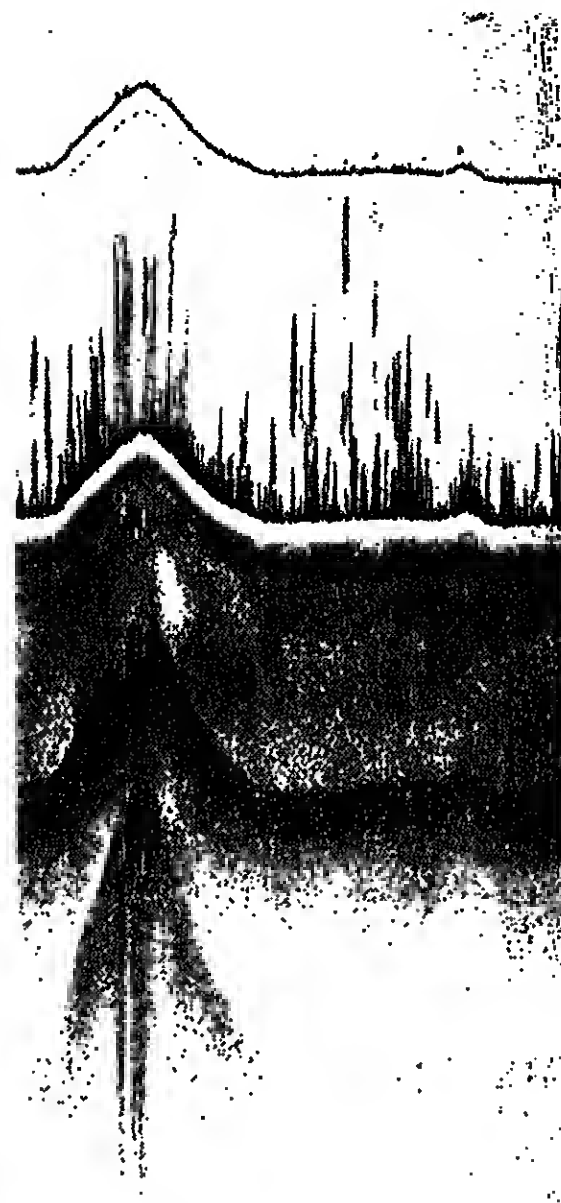
Recording is bottom locked in 100 m range. Range of expansion is 3 m. Displayed from top of paper and over 1/2 of paper width.



The recording here is in the pelagic mode and range is 500 m. Range of expansion is 3 m. Flat display on 1/5 of paper width. Observe the marker line which shows lower limit of chosen expanded range.



Recording is bottom locked in the 500 m range. It follows the bottom contour. Range of expansion 3 m which is written over 1/5 of total paper width.



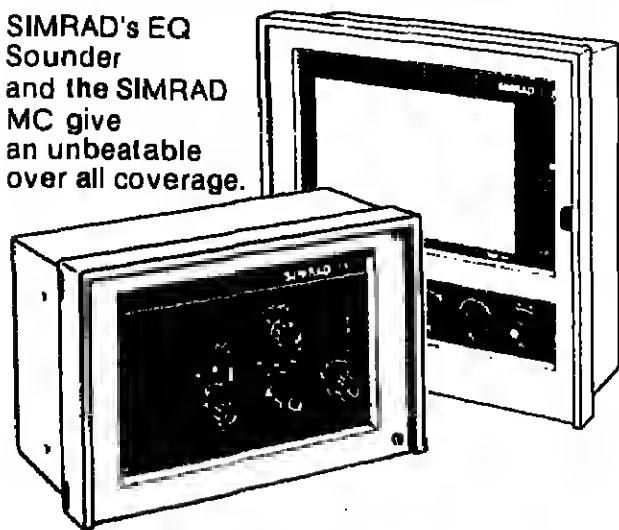
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Telephone: 01-353 6981.  
Cables: FISPROBOK, London  
Telex No: 21977.  
Editor  
Peter Hjul  
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Assistant Advertisement Manager  
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Subscription Information  
Subscriptions (surface mail,  
including the UK):  
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fast delivery rate: £16 (US\$27) a year.  
Outside Europe, airmail rate: £18 (US\$28) a year.  
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"Fishing News International" provides full and up-to-date information about the activities of fishery industries world-wide, in developed and developing countries.

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Readers also include designers and builders of fishing craft, makers of fish finding instruments, catching gear and processing machinery, consultants, operators of fishery protection services, and the many other people engaged in an industry that is harvesting and handling 73.5 million tons of aquatic creatures and plants a year.

## MARINE FARM ADVICE FROM BRITAIN

THERE is little doubt, says the British White Fish Authority in an attractive new booklet just published, that fish farming can add increasingly to the production from free-living marine resources. It adds that FAO "confidently expects" that by 1985 some 12 million tons of fish will come from farms. This may increase to 30 m. tons by early next century, if adequate support is provided.

The WFA has apparently brought out the rather lavish publication to promote its consultancy services in marine fish farming. Having been involved in this work in Britain since the mid-1960s, it believes it is "in a unique position to advise and assist those already in fish farming as well as those wishing to start."

### Persevered

Seen from a UK angle, the booklet is also a compact, clearly written counter to some pessimists in government research organisations who cannot see a future for aquaculture in Britain beyond moving into work already being done on trout and salmon in other countries.

The WFA has had its difficult times in marine fin fish farming. But it has persevered. And, if management of fish resources is to be positive (by enhancement) and not merely negative (by controls and restrictions), then the sea farming protagonists must be heard.

But all this digresses from the purpose of the booklet. Looking at the waters around the UK, the Authority sees a potential using

## comment

known technology) for farming about 50,000 tons of marine fish a year. Add to this a rich possible harvest of over 10,000 tons of trout and salmon and we have an activity which could be a vital producer of desired foods. It can also be extremely profitable to the investor.

From all this, the WFA argues that there are enough possibilities for siting farms and selling their output to justify continued investment in marine farming technology. "providing the costs of production become lower to the point of commercial viability."

### Cost studies

Here the going becomes a little more hazy, mainly because there is not enough information yet at commercial level. But studies do indicate that, for Dover sole and turbot at least, marine farms can

produce fish at costs below their value on the market. How long this would continue as farms boost supplies will need to be the subject of another study.

For the present, however, the WFA (and now a growing body of salmon and other marine farmers) has accumulated sufficient experience and expertise in this section of the fishery industries to advise and guide.

It has nearly 40 people engaged in farm work and has run experimental farms at five sites within the UK. All are aimed at evaluating commercial practice.

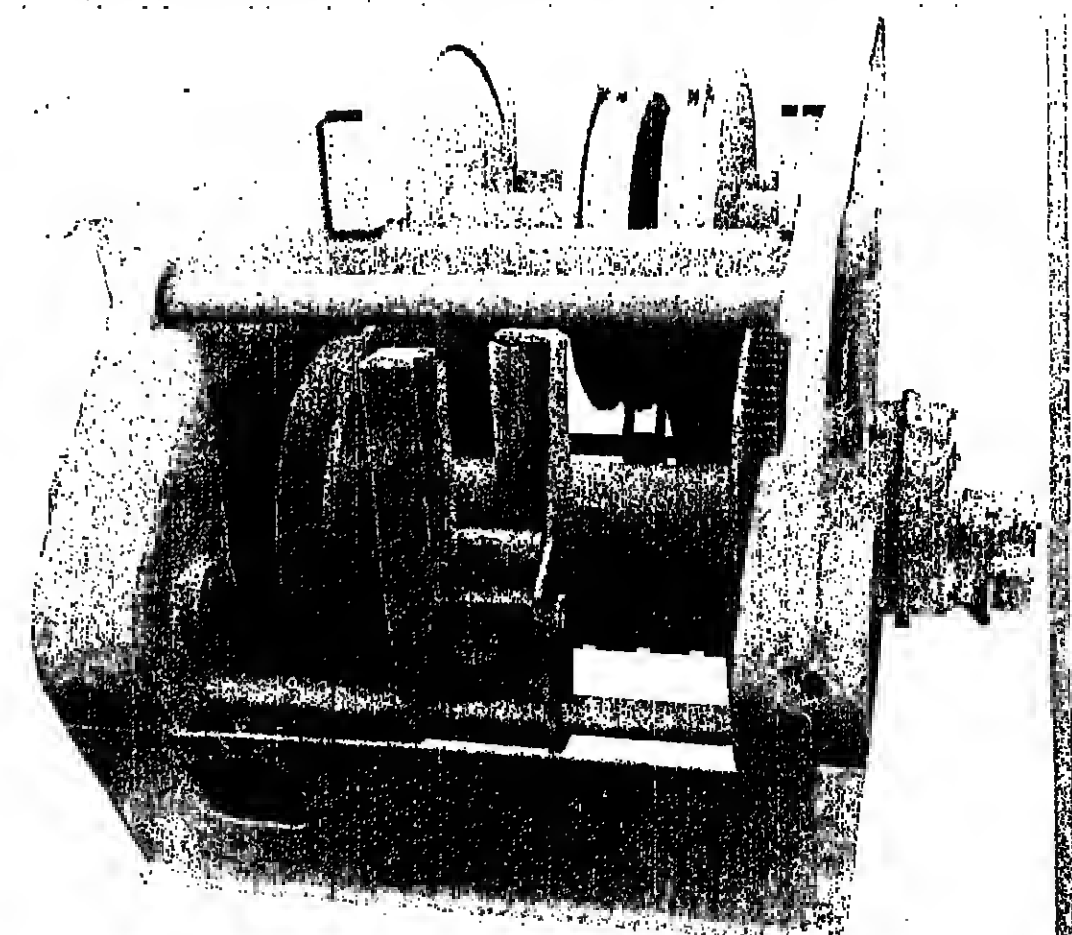
The results of this work are freely available to members of the British fishing industry. For private industry, for the development banks, and for companies and organisations outside, the WFA consultancy service is ready, and eager, to assist towards bringing in those 12 million tons.

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## Salvesen moves into Boulogne

THE SKIRT of bagpipes last month marked the move of Britain's largest cold store operator to the largest fishing port in France.

Christian Salvesen has set up a 20,000 sq. metre store just outside Boulogne. It was opened by Jean Wahl, chief civil servant to the Minister of Food in France, who described Boulogne as an important point of contact between Britain and Continental Europe.

Explaining his company's expansion into France, Salvesen chairman Max Harper Guw said that in Boulogne "we recognise the development of a fishing port similar in many ways to Grimsby, where we set up our first cold store operation in the UK."

# Norway fishermen 'compromise on state aid cuts'

## £43m. offer averts fleet stoppage...

STATE SUPPORT for Norwegian fisheries in 1978 has been agreed at 430 million kroner (about £43 million). This follows long and difficult discussions at one stage of which the Fishermen's Association threatened to stop all fishing.

A special addendum to the agreement says that the money shall be applied in such a way that a "reasonable equalisation" of earnings is promoted. In 1977 fisheries support amounted to 540 m. kroner and in 1976 it was 515 m. kr. For this year the government initially proposed only 300 m. kr. — while the Association wanted 670 m. kr. (about £67 m.).

Viggo Jnn Olsen, secretary-general of the Association sees the compromise as evidence of the "clear determination" to show restraint in Norway's present economic situation.

But he warned that, in future, his Association would press for compensation for the long hours worked by fishermen.

It is not possible, he said, to compare the earnings of fishermen with shore workers without taking into account the hours worked and the effort involved.

### Press reports

However, in an interview with the Norwegian fishing newspaper *Fiskaren*, he admitted that press reports of fishermen earning 150,000 kr. (£15,000) a year made it difficult for the public to understand why state aid on a massive scale was needed.

He explained that such earnings were exceptional and applied almost exclusively to purse seiners catching capelin. And this fishery, supplying raw material to the meat plants, received no support.

Mr. Olsen also said that a study in 1977 of the accounts of one medium-size purse seiner showed average earnings of 84,000 kr. (£8,400). But, broken down according to time worked, the pay per hour was only 23 kr. during the winter and 25 kr. during the summer capelin fishery.

## NEWS IN BRIEF



BRENDAN O'KELLY, chairman of the Irish Sea Fisheries Board, is in Tasmania on a three-month leave of absence from the Dublin-based organisation. He is acting as chairman of the newly-formed Tasmanian Fisheries Development Authority. Mr. O'Kelly examined and reported on the Tasmanian fishing industry in 1976. The new Authority consists of a chairman and three part-time members.

TAIWAN is investigating Antarctic krill as a raw material for fish meal. The 700-ton research ship *Hai King* was sent south early in 1977. She returned with 130 tons of krill for further processing and test marketing. She is carrying out another test voyage this year. Each year Taiwan imports around 90,000 tons of meal.

NORWAY has approved an agreement with Egypt for developing fisheries on Lake Nasser. Five million kroner (about £500,000) is being allocated to buy equipment for trawl fishing, resource surveys and also for technical assistance and training. Lake Nasser yields about 15,000 tons of fish a year. The fishery provides employment for about 6,000 men.

THE second phase of Mal's fishery development programme will be partly-financed by the EEC. It is one aspect of the aid package provided under the Lome Convention. The Mal catch is presently about 110,000 tons a year.

## COLD STORE OPERATION TAKEN OVER

THE FRIGOSCANDIA cold storage business was taken over last month by the Swedish industrial group Aga. Formed in 1949, Frigoscandia was a subsidiary of the Malmos shipping company which has been forced by the international situation in the shipping market to disinvest. Aga has bought all the shares in Frigoscandia.

From the opening of its first cold store, in Sweden in 1950, Frigoscandia has grown into a widespread cold storage operation with 29 plants in 13 countries. Its total refrigerated storage volume exceeds 2.2 million cu. m. The company is also well known in the fish processing industry for its range of industrial food freezing plants. Eight freezer lines cover a variety of preservation and processing needs.

# Are the anchovy coming back?

PERUVIAN fishermen have been heartened by the appearance of a new generation of anchovy, reports our correspondent.

The fish were seen in December and early January in growing quantities off the coast. They measure between five and 11 cm.

Last year was disastrous for the once-enormous industrial fishery. The catch slumped to 1.5 million tons, with the anchovy share only 400,000 tons.

The Peruvian Marine Institute has confirmed that the anchovy stock (estimated to have dropped to three million tons in May 1977) is beginning to recuperate. But it has warned the Ministry of Fisheries that it would be disastrous to permit any anchovy fishing in 1978.

Estimated at around 20 m. tons in the big years up to the early 1970s, anchovy stocks plunged to about four m. tons in 1972. This was due to a combination of over fishing and *El Nino* current intrusion.

By 1976 the stock was estimated to have recovered to 11 m. tons. But it dropped to six m. tons by October that year due to fishing and to another, less *Nino*.

## Spanish join EEC confusion

A DISPUTE which has flared up in France during the past few months provides an interesting example of the confusion in EEC member countries over who controls which areas, and which earlier agreements are still valid and which are not. The French estimate that between 480 and 500 Spanish vessels have been working in a controlled area from six to 200 miles off the coast of France. But only 72 vessels have been given permission to fish by the European Economic Community.

This led to so many incidents that it was decided to convene a special meeting in Bordeaux, with representatives from the French government, French fishermen and Spanish fishermen.

Justifying their position, the Spanish representatives argued that they were operating according to bilateral agreements between France and Spain. The French explained that they were now subject to control by Brussels.

Their spokesman suggested that the Spanish should approach the EEC Commission, but it would not be possible to allow 500 Spanish vessels to trawl within Community waters without licences.

Eventually some measure of agreement was reached. The French said they would not oppose a Spanish request to the EEC. In return the Spanish representatives said they would ask their government to lift a 20-peseta tax on certain French-supplied imported fish, to again allow the import of French eelers, and to allow French trawlers to land at Spanish ports.

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It is not just the human fishermen who wait anxiously for the return of the anchovy. When the fish are not running, the pelicans have to live as scavengers. Picture by FAO.

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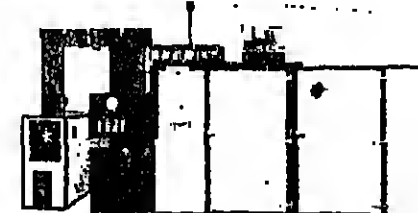
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## Dual sonar in 'Green Field'

WESMAR's dual sonar system has become an important part of the Chambers Brothers' fishing operations aboard their modern trawlers *Green Field* and *Green Isle II*, out of Annalong, Northern Ireland.

Victor Chambers was a pioneer of midwater trawling in the late 50s and has been alert for such advances in fish finding gear as the new WESMAR system.

The *Green Field*, like her sister ship *Green Isle II*, has the most modern electronic gear, which gives her added flexibility on the fishing grounds.

Tom Stephenson, the capable skipper of the *Green Field*, has devised a new fishing technique in which he uses one of his low frequency sonars along with the WES-

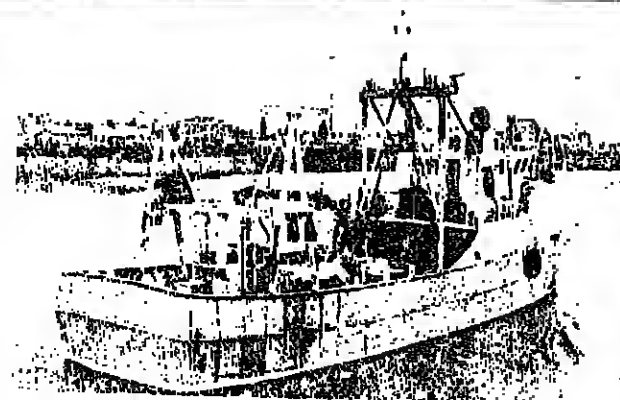
MAR SS220 high frequency sonar.

When Stephenson arrives at the fishing grounds, he sets one of his low frequency sonars with very little tilt. This means that the low frequency unit scans at maximum range to locate the schools of herring or mackerel.

At the same time, he sets the WESMAR SS220 high frequency unit at about 15 deg. tilt.

As the *Green Field* moves toward the school spotted on the low frequency unit, the school soon comes within range of the SS220.

The narrow sonar beam of the SS220 makes it ideal for detailed definition of targets at close range. The SS220 permits Stephenson to judge the density of the school and track its movements to catch

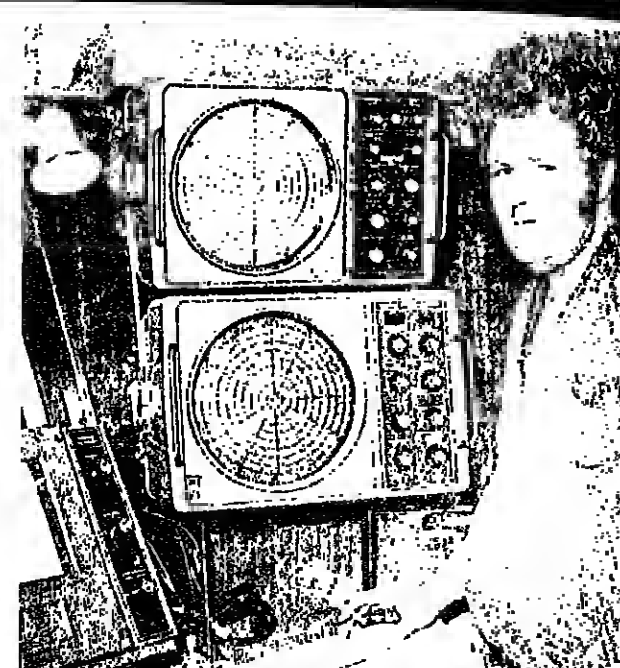


The Chambers brothers' *Green Field*.

the maximum quantity of fish.

By using this technique, Stephenson does not have to continually adjust the sonar as the school of fish moves closer to the *Green Field*. By using both high and low frequency sonars together, he is taking advantage of each sonar's strong points.

In addition, Stephenson believes that the WESMAR SS230 low frequency sonar is an excellent back-up sonar should the SS220 become damaged on the fishing grounds. This gives him the added assurance that he will be able to compete effectively for the available fish.



Tom Stephenson with WESMAR's dual sonar system.

## Sonar system now widely adopted

COMMERCIAL fishermen around the world are adopting WESMAR's new dual sonar system to increase the flexibility of their fishing operations. Fishermen in Great Britain, Spain, and the United States have begun to install this new system.

With these sonars, the fisherman has the detailed resolution of the high frequency sonar and the range capability of the low frequency unit.

The SS220 high frequency sonar, R60 chart recorder, and SS230 low frequency sonar.

## Sonar success brings orders from Portugal

PORTUGAL has embarked on a major modernisation of its commercial fishing fleet. The recent purchase of 45 WESMAR scanning sonars attests to this effort.

The effectiveness of WESMAR scanning sonars in Portuguese waters is becoming known throughout fishing circles. J. Felhao was the first commercial fishing company in southern Portugal to install a WESMAR SS220 scanning

sonar on one of its boats. The success it has met since installing the SS220 has prompted many other fishermen and fishing companies to purchase WESMAR.

J. Felhao is a well-known and respected fishing company in Portugal. Its purse seiner, *Felhao*, was outfitted with the SS220 high frequency sonar so that it could compete effectively in today's fishing industry.

During a recent visit to the area, Nathan Roundy, WESMAR's International Marketing Manager, was aboard the *Felhao* on a fishing trip for sardines. The SS220 scanning sonar worked superbly in locating a scattered school of sardines. The sardines were located at 300 metres in deep water. Five tons were netted and brailled aboard for an average haul of the scattered fish.

According to Roundy, the high frequency of the SS220 is extremely important for success in this fishery. The sardines are very scattered, which makes it difficult to spot a dense concentration for a good set.

Besides effectively locating fish in deeper water, the SS220 has located mackerel in very shallow waters of 7-10 fathoms.

## Soaring sales in Japan

MR. PHIL WERDAL, trained in international business and commercial fishing, has been appointed WESMAR representative in Japan to handle the increasing demand for WESMAR scanning sonars by fishermen there. In association with Tokyo Kaiki, WESMAR's Japanese dealer, Mr. Werdal is introducing WESMAR scanning sonars to Japan, Korea, and Taiwan.

Tokyo Kaiki, a worldwide leader in supplying gyro compasses and radar to oil super tankers, believes that the advanced technology of WESMAR scanning sonars will make them a major force



Phil Werdal, WESMAR's representative in Japan.

In the Japanese commercial fishing industry.

After his first nine months in Japan, Mr. Werdal reports that Japanese fishermen are mov-



Japanese fishermen have found WESMAR sonars an effective aid in locating tuna.

ing to WESMAR in ever-increasing numbers. In the last six months of 1977, for instance, 90 sonars were sold to Japan.

Japanese fishermen find that WESMAR meets their needs. The high resolution of the WESMAR allows the fishermen to distinguish scattered and small fish. This is particularly important in de-

termining the densest part of a school to set on.

The compact size of the WESMAR scanning sonars make updating older boats economical and easy. With the WESMAR, there is no need for major modification of the boat. Installation is uncomplicated and the console fits easily in any wheelhouse.

## ANOTHER BIG FISHING YEAR FOR NORWAY

THE NORWEGIAN fish catch has exceeded three million tons for the second year in succession.

At 3,160,000 tons, the 1977 catch was slightly below the 3,183,000 tons of 1976. But the landed value reached a new record of 2,900 million kroner (about £290 million), up 180 million kr. on 1976.

Capelin was the main volume component of the 1977 catch with 2,113,000 tons which earned 757,500. This was an increase over the 1,972,289 tons of 1976 and it helped to make up for a drop in the sprat catch from 114,047 tons to 33,600 tons.

Also down was the catch of Norway pout, from 214,524 tons in 1976 to 144,700 tons last year. The mackerel catch fell from 212,119 to 173,900 tons, while that of herrings was down again, from 36,540 to 20,260 tons.

There were increases, however, in the catches of blue whiting (from 25,839 to 38,800 tons) and sandeel (from 44,408 to 78,500 tons).

The cod fishery maintained its steady increase in catch with 287,300 tons, up from 279,215 tons in 1976. And fishermen's earnings from cod jumped from 940 m. kr. to more than 1,040 m. (about £104 m.). The haddock catch dropped from 37,052 to 30,200 tons but there were few other substantial changes in the composition of the demersal catch.



Into another good year? Norwegian small coastal fishing boats in the Lofoten winter cod fishery. The cod catch has increased steadily over the past four years.

## Trials off Argentina

UNDER a contract from the government of Argentina, Nippon Suisan and four other Japanese fishing companies are to carry out a year-long study of waters south of 40° S.

They will try to discover if these waters can be profitably fished. The catch target is about 100,000 tons.

### The companies

Participating with Nippon Suisan are the Taiyo fishing group, Nichiro, Tokyo Fishery Company and Hyoko Fishery Company.

In 1977 these companies together bid successfully in response to an Argentinian call for tenders to carry out experimental fishing off Patagonia.

The contract provides for a scientific investigation of resources in the region, a feasibility study for shore-based processing plants, and the construction of a \$6 million research vessel for loan to the government of Argentina.

If the experimental phase is successful, a commercial operation will be started using either small ships to supply plants on the Patagonian coast, or larger ships to process at sea.

"The cost of a land-based operation could be between US\$10 million and \$50 million," said Yoshinobu Sakamoto of Nippon Suisan. "The figure will depend on a number of variables. For example, how much will it cost to buy the smaller ships, what size of shore plant, what infrastructure and other facilities will be needed?"

"If we build ships with factories that could handle 15,000 tons of fish a year, each would cost about \$8 million."

### An outlet

Not mentioned by the Japanese is the possibility that a fishery developed off Argentina might be an outlet for some of more than 120 "bunkens" medium-size stern trawlers made idle in Japanese northern ports by the USSR 200-mile zone.

## Antarctic krill mothership

FURTHER news of Japan's 1977/78 work on krill fishing in the Southern Ocean (see *ENI* January) is that, in addition to an 8,000-ton mothership and ten 350-ton trawlers, nine other trawlers are operating in an area near latitude 64° S and longitude 120° E. Last year, the Japanese krill production was 12,000 tons; the target for this season is 20,000 tons.

## A FISH TO FIGHT MALARIA

A SMALL fish known as the Gambusia is being imported by Turkey from America. It will be introduced into ponds and other waters in the south-east of Turkey to help combat malaria.

Over the past two years malaria cases in the area

have jumped from 10,000 to 120,000. The anopheles mosquito has developed a resistance to insecticides and has proliferated.

The fish has a taste for mosquito larvae and it is hoped that it will help keep the insects under control.

## Christian Salvesen open a new cold store:

### The most efficient in France.

We now complement our extensive cold storage network in Britain by providing you with a springboard into Europe for your frozen food produce.

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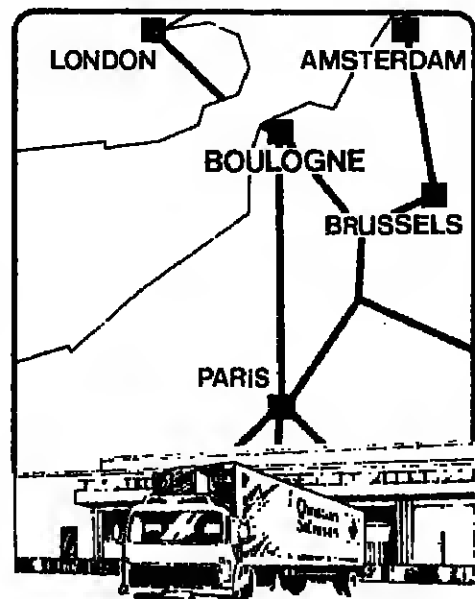
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The Portuguese purse seiner FARILHAO.



Portuguese fishermen brailing sardines.



Lynn Trotter with his WESMAR sonar.

## Charter boat is going for tuna

LYNN TROTTER, a charter boat operator off the state of Washington, credits his WESMAR scanning sonar with locating 100 tuna for his party on a recent trip.

"Every fish we caught that day I found on the sonar," he said.

So excited is Trotter with his scanning sonar that he intends to put his 95-foot charter boat, *Neckle Rose*, to a new use.

"I'm going to fish commercially for tuna this year."

With the WESMAR to locate the tuna, he will be well equipped for a successful season.

Even when fishing is poor, the WESMAR sonar helps Trotter. "At least with the sonar I know what's there and what's not," he said. "You don't stay in an area where there aren't any fish."

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## AUTOLINE GOING NORTH

THE MUSTAD Autoline system is now being widely used in long line vessels operating out of ports in northern and western Norway.

With the system, long liners are, says Mustad, taking catches of cod twice as large as fresh fish trawlers off Tromsø and North Cape.

The Kristiansund vessel *Oyliner* caught 51 tons of cod for sailing on a recent trip, and 144 tons over a 24-day period.

Last month five West Norway boats equipped with the Autoline set out for

northern waters instead of engaging in their usual net fishing.

So far, 35 vessels have been fitted with the Autoline system, which mechanises most of the lining operations from baiting to hook cleaning.

It is claimed to save the work of two to three men compared with the conventional methods of handling long lines. And the work of the rest of the crew is made easier, says Mustad.

The company also claims that vessels with Autoline can be employed more efficiently because it is possible to adopt

24-hour working based on shifts. Previously, the Autoline had been adopted mainly by West Norway fishermen catching dogfish in the North Sea. Mustad sees its application to cod fishing in the north as a breakthrough for the system.

Arild Nylund, fisheries inspector in Troms county, says the development is particularly significant because long lining is a selective form of fishing and can be done by small boats.

Thus the population pattern in North Norway can be preserved.



The Autoline system in a Norwegian longliner...

## Skipjack study in South Pacific

THE CENTRAL and Western Tropical Pacific Region is more than 98 per cent. water. It is not surprising therefore that there is growing national interest in the exploitation and rational management of the marine natural resources of this vast area.

Of these resources, tunas seem to have the greatest potential, particularly the schooling skipjack which is already being fished in the region.

The South Pacific Commission has therefore given priority to a skipjack survey and assessment programme.

After months of intensive negotiations involving interested countries such as Australia, France, Japan, the United Kingdom and New Zealand, the programme has now started. Contributions totalling more than US\$900,000 have enabled scientific staff to be recruited and a suitable live bait pole and line boat to be chartered.

Responsible for the negotiations and a driving force since the very inception of the programme is the co-ordinating officer, Dr. Bob Kearney.

### Tagging

During the envisaged three-year survey period, some 100,000 skipjack are expected to be tagged and released. This is intended to help the scientists make reasonable assessments of the migration patterns of these fish, and so assist in management decisions.

This is regarded as particularly important in view of the increasing interest in the fishery not only by the Pacific territories but by fishermen from Japan, Taiwan, the United States, the Soviet Union and South Korea.

### RIVER FISH KILLED BY MINE SILT

IN EASTERN Malaysia (Sabah), a copper mine is reported to be causing pollution which is interfering with the fishing activities of 50,000 to 70,000 villagers along the banks of the Sugat River.

The pollutant from the Mamut mine at Ranau consists of fine silt flowing down the river. It is said to be destroying fish and prawns or which the villagers depend for protein.

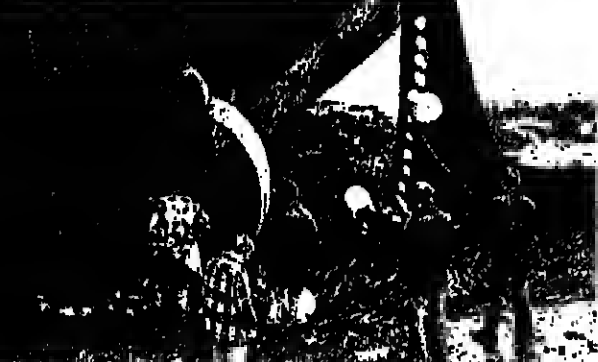
### Criticised

Operators of the mine, the Japanese Overseas Minerals Resources Development (OMRD) group, who, with local shareholders, are being criticised for going ahead with the project without regard for the consequences.

Local government officials admit they don't quite know how to deal with the problem, more intractable than a discharge of fuel oil.

A TANGLE to remember in a nightmare. The crew of the Scottish 167-ton purse seiner *Pathfinder* work to free her £43,000 net which got caught up in the vessel's nozzle-strutted propeller. The *Pathfinder* and her crew of 12 were fishing for mackerel south-west of the English coast last month when the accident happened.

At the time they were hauling in a catch estimated at about 100 tons.



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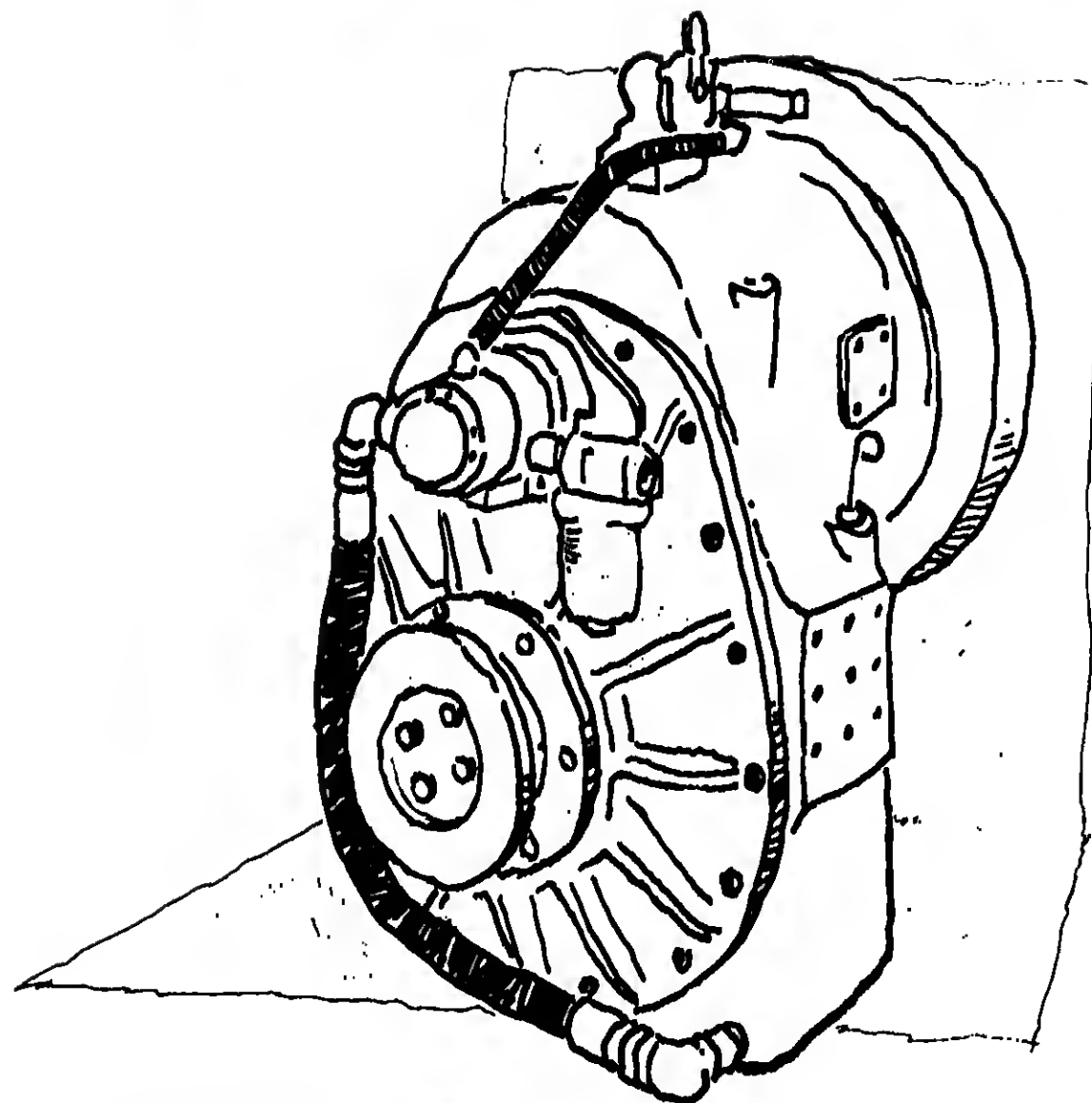
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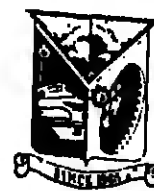
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## 200-mile fishing limits...

THE NEW ZEALAND government has had its first negotiations over fishing rights in the new 200-mile zone with two "invited" nations — South Korea and the Soviet Union. The talks were to clarify and seek acceptance of the New Zealand principles for foreign participation in exploiting resources inside the zone.

Full details of the negotiations and agreements will not be released until ratification by the governments concerned. But South Korea and the Soviet Union unreservedly accepted New Zealand's right to control and manage her 200-mile EEZ. This includes the sole right to fix the total allowable catch (TAC), decide quotas, pricing, species and areas to be fished when the licensing system comes into effect on April 1.

In return New Zealand has apparently agreed to the granting of fishing licences. But no details have been given of decisions on methods of catching, level of fishing, number and size of vessels, species or quotas.

The leader of the team negotiating with South Korea, Mr. I. L. G. Stewart (formerly NZ Ambassador to the EEC) said that a good agreement had been reached and that New Zealand had "succeeded in maintaining all our essential points."

One "essential point" is that the South Koreans have been told that New Zealand "expects the agreement to be limited to genuinely Korean boats."

Prime Minister Muldoon said that the government had no intention of letting Japanese interests into New Zealand's fishing zone "through a back door" because of the Japanese practice of investing in the Korean fishing industry.

These negotiations set an important precedent. It is very significant that South Korea has no history of trawling in New Zealand waters — but is a potential market for agricultural products. She appears to have been totally excluded from the USSR 200-mile zone.

The South Korean precedent was put to the test within three days when the Soviet delegation, headed by Deputy Minister of Fisheries Mr. G. H. Zhigalov, began discussions with New Zealand officials.

The Russians were seeking three things:

- (a) Continuing access to fish resources in the New Zealand zone.
- (b) Access to facilities for repair and maintenance of Soviet fishing vessels and the right to exchange crews.
- (c) A joint venture with a New Zealand company for the "development of the fishing industry."

### Reaction

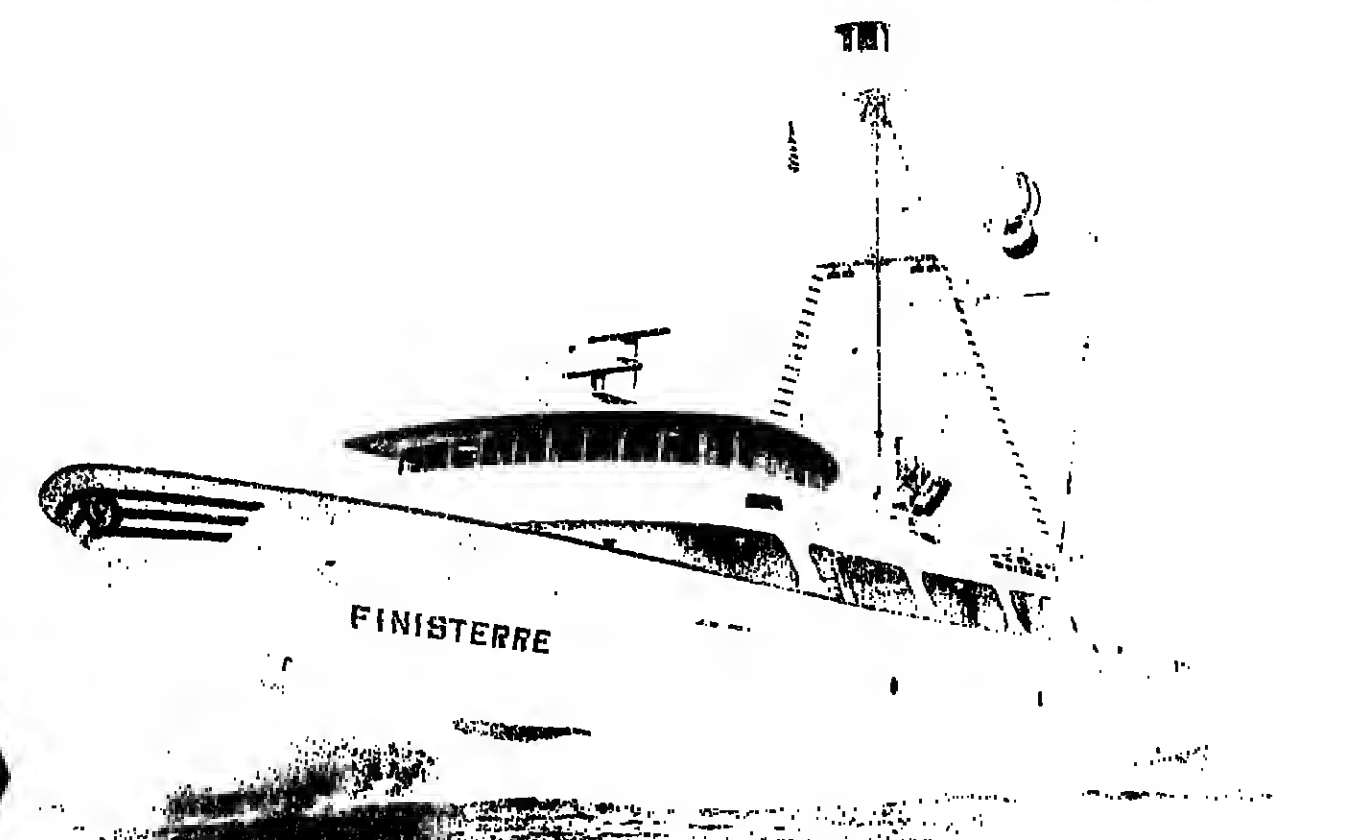
New Zealand government reaction to these requests was expressed by the Prime Minister when he said that the Russians would not be given exclusive fishing rights; they would be given only normal access to fishing facilities.

Mr. Muldoon also said that no other country had sought similar facilities for fishing vessels. The Soviet airline Aeroflot would not be permitted to fly in fishing crew replacements through such replacements would be discussed.

After several days of discussions the Soviet delegation left with two points (which had been accepted by South Korea) undecided. No agreement is likely to be signed until these have been settled.

The two points at issue are:  
(1) Whether two small triangular areas enclosed within the New Zealand 200-mile zone can be fished by Russia as "high seas."

The US tuna purse seiner *Finisterre* a successful year in New Zealand waters



## New Zealand starts talking to Russia and South Korea

highly migratory tuna species which seasonally move through the NZ 200-mile zone. But New Zealand, in conjunction with the many countries, territories and islands of the South Pacific, will seek to manage the migratory fish which move within the vast areas of the Pacific covered by the overlapping 200-mile zones of those Pacific States.

There are a number of purse seiners owned by New Zealand companies also fishing for skipjack and other pelagic fish species. Some criticism has been levelled at the government by these companies for permitting the chartered US purse seiners to operate close to the New Zealand 12-mile territorial sea.

This attitude is an indication of the critical view the domestic industry is likely to adopt where any foreign vessels compete directly for fish.

(2) The acceptance by Russia of New Zealand's responsibilities to the Cook Islands, Niue and the Tokelau (as recognised by the United Nations). These island territories will declare 200-mile zones soon and Russia wanted to negotiate direct with the islands, objecting to the recognition of "imperialist" or third-country control. The New Zealand negotiators demanded that the Soviets recognise New Zealand's UN accepted responsibilities.

Little indication of the other matters on which agreement was reached was made public at the time. But what has been said could cause some concern in the New Zealand fishing industry. For example, it is reported that "the question of a joint venture between the Soviet Union and New Zealand companies would go ahead after the final agreement is reached."

The NZ Pelagic Fisheries Development Company has chartered the US tuna purse seiners *Apollo*, *Zapata*, *Discoverer*, *Kerri M* for the present skipjack season.

It is possible that the United States may question New Zealand's jurisdiction over the

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## CANADIANS SHOW THEY CAN KEEP CONTROL

THERE WERE 17 violations of Canada's 200-mile fishing zone during 1977, Environment Department officials reported in Halifax.

All of these were off Newfoundland, and there were only a "few minor incidents" off the Maritime Provinces.

The violations off Newfoundland involved 14 foreign and three Canadian vessels. Incidents ranged from fishing inside the limits without a licence to vessels working in areas they were not licensed to fish.

Six Soviet ships were convicted and

they paid a total of \$32,500 in fines. Three convicted French ships paid \$2,500 dollars. Two Norwegian paid \$5,000, two Polish trawlers \$6,000 and a Portuguese vessel \$500.

Surveillance and enforcement efforts by the Canadians in the first year of the 200-mile EEZ were described as "highly successful" by H. Douglas-Johnston, federal fisheries director-general for the Maritime Provinces.

He added that patrol vessels had spent 874 days at sea watching over the EEZ; patrol aircraft flew more than 3,500 hours and covered almost 15 million sq. miles.

In the Maritimes region, 358 foreign and domestic vessels were boarded at sea and 99 inspections were carried out in port.

Off Newfoundland, there were 33 boardings inside the limit and 58 outside; and 193 vessels were boarded and inspected in port.

As reported in January, foreign ships will now pay licence fees for fishing inside Canada's EEZ. The computerised surveillance system will be improved in 1978 "to assist staff in performing more sophisticated and comprehensive operations."

# NORWAY SET FOR SOME TOUGH BARGAINING

NORWEGIAN Fisheries Director, Knut Vartdal, has warned that the international fisheries climate is likely to grow "much harsher" in the early part of 1978. Addressing the Fishing Boat Owners' Federation in Kristiansund in January, he said:

"We face many difficult negotiations with other fishing nations. We must give as well as take, and we must expect to surrender valuable fishing rights so as to be able to demand fishing rights from other countries."

But owners at the meeting felt that Norway should adopt a stricter line in her dealings. They contend that EEC fishing countries and the USSR take more fish from the Norwegian EEZ than the Norwegians take out of EEC and Russian waters.

They also complain that Norway does not have the facilities or the capacity to control foreign fishing to the extent they had expected.

This was admitted at another meeting in January by State Secretary Birger Lursen.

Vessels entering Norwegian waters were expected to report their arrival and state their fishing plans. They should then report catching progress and, finally, their departure.

A random check by the Fisheries Directorate had shown that many Danish industrial trawlers had failed to report as required.



Knut Vartdal

**'We must give as well as take'**

Mr. Lursen also dealt another blow to British fishermen's fast-fading hopes of a UK-only 50-mile zone inside the EEC 200-mile limits.

In negotiations with the EEC, he said, Norway had insisted on the right to fish up to 12 miles in the EEC zone. Special rights for Britain within a 50-mile belt "are unacceptable to us."

## ICSEAF wants five-month pilchard ban

AT ITS FOURTH regular session in December, the International Commission for Southeast Atlantic Fisheries (ICSEAF) was confronted by a drastic new development. South Africa, the largest fishing coastal state in the region, is applying a 200-mile limit.

Strangely, however, the official release of the session held in the Canary Islands under the chairmanship of Dr. S. A. Studenetsky, Deputy Minister of Fisheries of the USSR, makes no mention of this.

There are now 16 member countries, and observers from South Korea and the USA also attended the session.

The session did, apparently, recognise the slump in pilchard stocks of Namibia (South West Africa). It recommended scientific studies of the state of resources in the area.

Another recommendation was a five-month closed season for the pilchard fishery and a catch limit for the species of 135,000 tons in 1978.

It also agreed on a recommended total catch of 675,000 tons of hake in 1978. Quota allocations for member countries provide for 480,000 tons for the area located outside waters under national fisheries jurisdiction.



Dr. A. Labon

**'A number of countries have to formulate a new fisheries policy'**

# A status boost for the industry

IT HAS taken wider limits to make many countries aware of the food potential of their waters. Now they are faced with problems of management and development of these resources. And one result is that fisheries are becoming a significant feature in some national economic plans.

An early need is to decide on priorities and then to formulate a comprehensive fishery policy.

Speaking at the meeting in Cochín of the Indian Ocean Fisheries Commission, Dr. A. Labon, Director of FAO's Fishery Industries Division, said that such a policy had to be viewed as part of a government's overall economic policy.

"A number of countries requesting assistance not only want to review development and exploitation but need first to formulate a new fisheries policy," Dr. Labon told FNI correspondent Cedric Day.

"This, of course, must be done before programmes and projects for development can be drawn up."

For some countries the new 200-mile limits may cause a loss of fishing resources. They may have to find ways of offsetting this by reaching agreement with the new owners of the resources to obtain a share of them.

"This can become complicated," Dr. Labon continued. "Those in control of the resources have to determine how much they require to harvest, the extent to which the resources should be exploited, how much they can export themselves or the amount that should be allotted to other countries and the terms and conditions under which such an allocation can be regulated."

"There are cases where yield from the resources far exceeds the requirements of those who control them. The sustainable yield may also be beyond the country's catching ability."

"In such cases joint ventures, from which the coastal countries and their foreign partners can benefit, may be the best way to assist development. Also, while exploitation may be most easily achieved by catching for fish meal, the absolute priority should be to use the resources for human food."

## 200-mile fishing limits

# FAO'S ROLE IN THE NEW ZONES

THE NEW 200-mile fishing limits are presenting a number of developing countries with serious problems of management, as well as opportunities for development. The Department of Fisheries of FAO has therefore been directed by the 19th Session of the FAO Conference to prepare a "comprehensive programme" to help them.

A recommended first step is the preparation of a medium-term programme in co-operation with the countries. This should have clearly defined aims, priorities, target dates and proposals for resource allocation.

"The whole question of the new regime of the sea and the fundamental changes being brought about by the extension of national jurisdiction occupied much of the fisheries discussion at the Conference," said FAO fisheries chief, Herman Watzinger.

Development of fisheries in the new economic zones would, the Conference noted, "place greater demands on coastal states in terms of research, surveys, management measures and enforcement," as well as on processing and marketing.

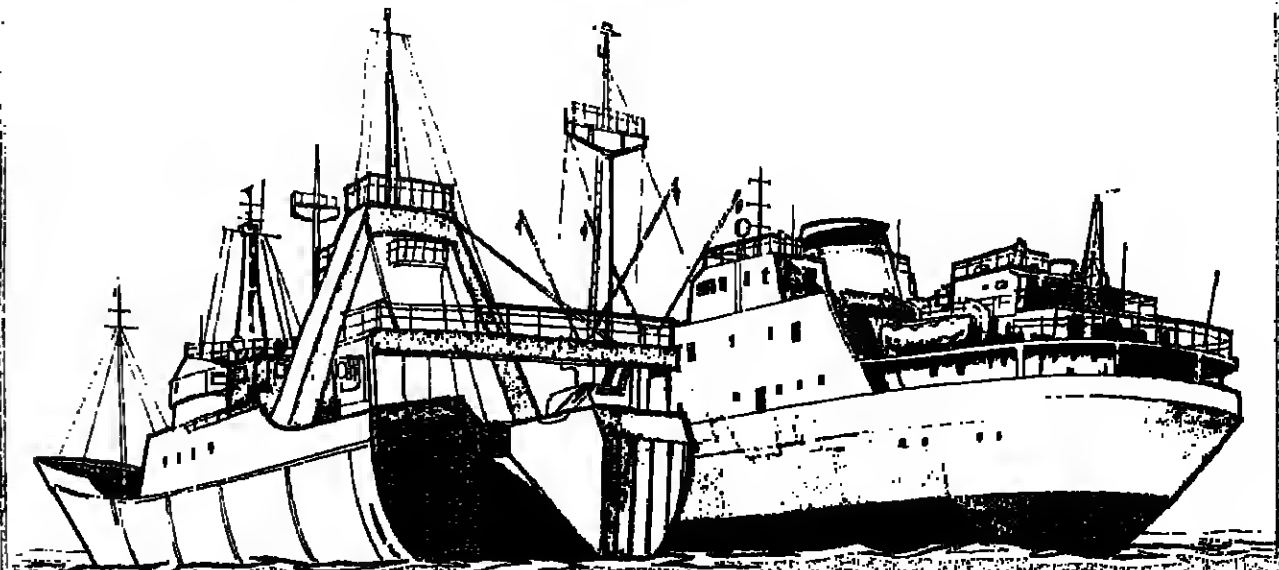
Some regional fisheries bodies have already taken on wider responsibilities for management. These include the Indo-Pacific Fisheries Commission (IPFC), the General Fisheries Council for the Mediterranean (GFCM), and the Commission for the South Pacific (CSP).

The Conference urged that other regional bodies, especially the Indian Ocean Fisheries Commission (IOFC), should do the same.

Mr. Conroy, who heads a company in America called Specialised Aircraft, has developed a turbo-prop modification. In this, reports the Los Angeles Times, the old piston engines are replaced by two turbo engines. And a third turbo engine is built into the nose.

The plane's characteristic profile is spilt, but the new engines improve performance. Mr. Conroy sees his modernised DC-3 as "ideal aircraft" for coastal patrol.

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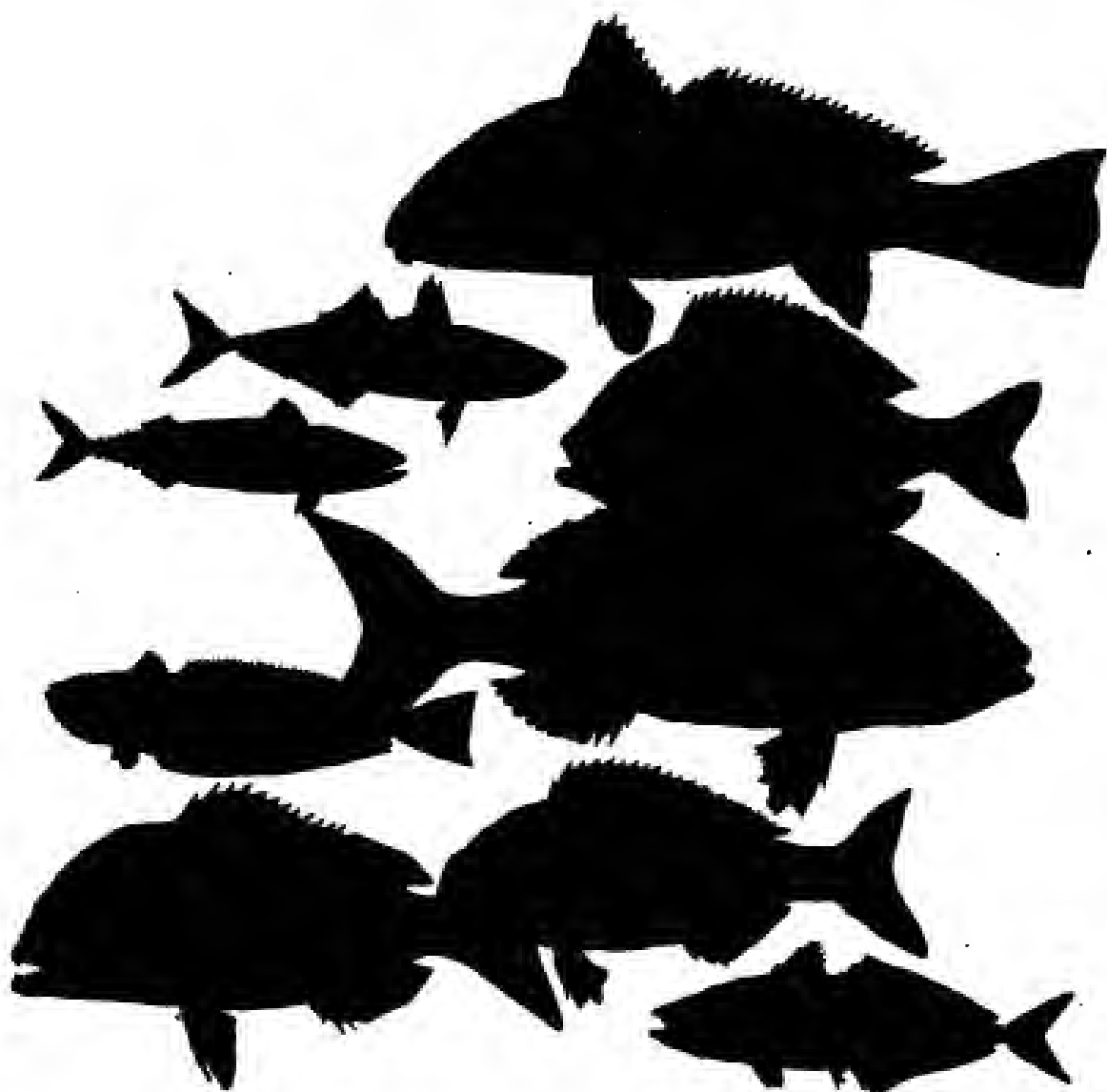
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# SALMON BASE IN CHILE

Continuing his review of salmon ranching attempts in Chile, DR. TIMOTHY JOYNER reports the latest project — by the fish farming subsidiary of a large American corporation. He then suggests why earlier schemes might have failed, and why the best chances of success should come from introducing the salmon far south into the circumpolar West Wind Drift.

## Part two—Far south into the Polar seas

THE NEXT investigation into salmon propagation from Chile took place in 1975 and 1976 when an international (Chilean, American and British) team surveyed the potential for salmon production in the southernmost Chilean province of Magallanes.

Funding was provided by the Rockefeller and Tinker Foundations, and logistic support by the Chilean Navy, the Instituto de Fomento Pesquero and the Division de Protección Pesquera.

The team concluded that (1) fresh water suitable for salmon hatcheries was available, and (2) the channels and sounds of the region were well fitted for becoming nurseries from which salmon could reach ocean feeding grounds from which they should be able to return.

In 1976, the Union Carbide Corporation, guided by Jon Lindbergh and other experts from its subsidiary, Domsea Farms Inc., began an experimental salmon ranching venture near the town of Aneud (42 deg. S) on the island of Chiloe. During the summer of 1977-78, 100,000 coho smolts of a stock from the Baker River in Washington are being released from the small rearing lake into a stream that flows into the Gulf of Aneud.

### Similarities

It remains to be seen whether Union Carbide will be any more successful than the Division de Pesca y Caza, which released 180,000 of the same species into the same gulf in 1968-69.

From the many attempts to introduce salmon into Chile, beginning in 1905 and continuing to the present, it is clear that the proponents of the idea were stimulated by the obvious similarities between southern Chile and the coastal areas in the Northern Hemisphere where salmon are abundant.

Biologists from Chile, the United States and Japan who have made detailed studies of the Chilean coast from Puerto Montt to Tierra del Fuego have, without exception, concluded that the environment of this region should favour the successful acclimatization of introduced salmon stocks. This conclusion was reinforced by the successful introduction of trout into Chile, and the subsequent development there of sea-run variants.

Since repeated attempts to acclimatise salmon in Chile have failed, it is fair to ask, "What went wrong?" Salmon experts, when confronted with this question, tend to frame their answers in terms of their direct experiences.

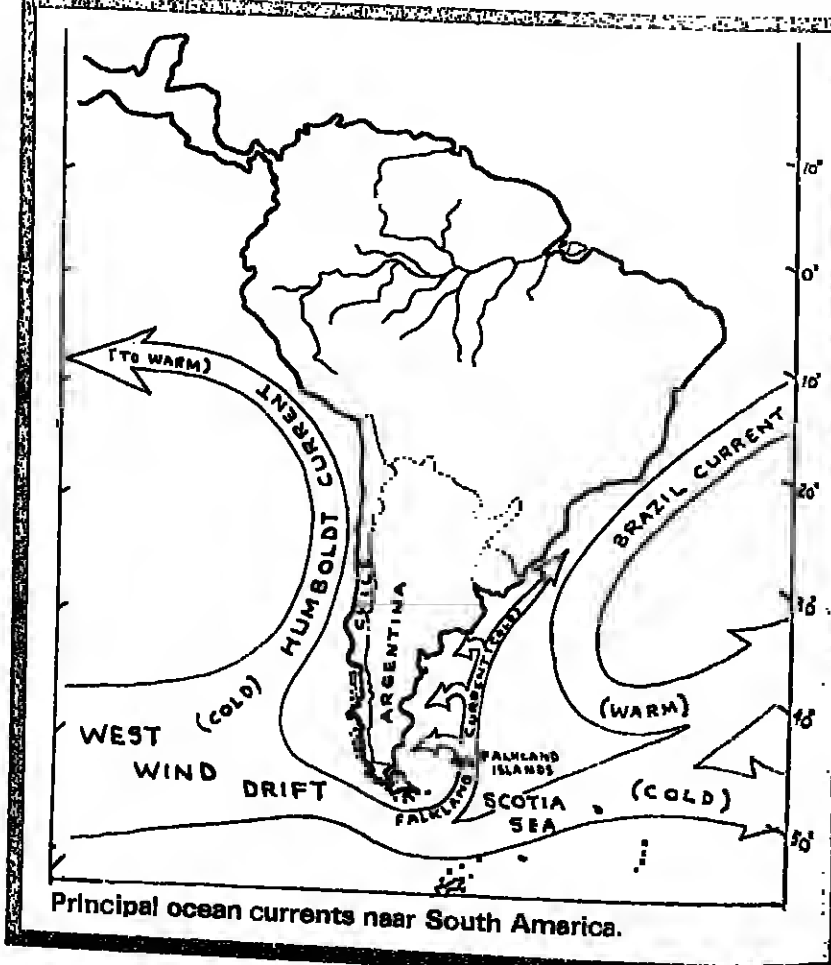
A beach at Puerto Montt in the south of Chile. Salmon ranching in this area may fail because it is not far enough south. Picture by FAO.

Because these mostly involve the handling and observation of salmon in the fresh water hatcheries and spawning streams, or close inshore where returning adults are trapped and netted, explanations have focused on deficiencies in the handling of juveniles or on the problems of fresh water production. Little attention has been given to the ocean environment where salmon spend the better part of their lives.

To be sure, American and Japanese experts who surveyed Chilean waters in the late 1960s and early 1970s did

consider carefully some of the properties of the coastal environment that would be confronted by salmon migrating seaward from Chilean streams.

In 1969, a Chilean, Dr. Sergio Hasido, touched on a factor that has largely been ignored when he wrote: "There is a characteristic in the swimming behaviour of salmon that fits satisfactorily with the electric field hypothesis previously mentioned — these fish generally swim with the current. The word in parentheses and those in italics have been added for clarification and for emphasis.



The electric field referred to relates to one of the mechanisms that have been proposed to explain how salmon navigate on the high seas. But the part of Dr. Basulto's observation that is significant to this discussion is "... these fish generally swim with the current."

In Goode's School Atlas there is a multi-coloured map giving the direction of ocean currents at the sea surface for the entire globe. It shows clearly some very basic elements of global marine geography.

In the North Pacific and North Atlantic Oceans, warm, eastward-flowing currents veer poleward, towards the land along north-west coasts (North America and Europe).

Along north-east coasts (North America, Japan and Siberia), cold, longshore currents flow equatorward, mingling with warm, offshore currents flowing north eastward from the subtropics.

A glance at the Southern Hemisphere reveals a very different picture. Along most of the west coast of South America, the cold, powerful Humboldt Current sweeps equatorward, then off the coast of Peru, it veers offshore to mingle with the tropical South Equatorial Current.

In the Southern Ocean, the principal feature of surface flow is the circumpolar West Wind Drift.

This flow diverges where part of it strikes the South American coast at about 50 deg. S. The northern component becomes the Humboldt Current. The inshore part of the southern component curls around the tip of Tierra del Fuego to become the cold Falkland Current that flows equatorward along the Argentine coast where it ultimately merges with the

poleward-flowing, warm Brazil Current.

Here, as off the coast east of New Zealand, the situation is not too dissimilar to that off Labrador and Japan where cold, equatorward-moving longshore currents merge with poleward-moving, warm currents.

With these features of global geography in mind, and considering the observation that salmon generally swim with the current, I would like to speculate on what might happen to salmon migrating seaward from the Chilean coast.

Released from streams flowing into the Pacific north of the divergence of the West Wind Drift, they would merge with the Humboldt Current. If they swam with it, the current would carry them into tropical waters far from the influence of the land.

Released from streams south of the divergence, they would likely be carried by the Falkland Current into the cool, plankton-rich waters over the Patagonian shelf where the effects of terrestrial runoff should help to lead the spawners to their natal streams.

### Venturesome

Venturesome stocks that travelled further seaward after leaving streams south of the divergence, would be carried through the Drake Passage into the Scotia Sea with its summertime swarms of krill.

Whether orographic upwelling against the island are bounding the Scotia Sea would prevent such salmon from being swept westward completely around the planet can only be guessed.

In the event that it would not, it is

interesting to note that at latitude 55 deg S, a circumpolar journey at an average speed of one knot would be completed about every two years. A salmon if it survived such a journey, would find itself close to its point of departure at two-year intervals, when plumes of continental runoff may lead it back to its natal stream.

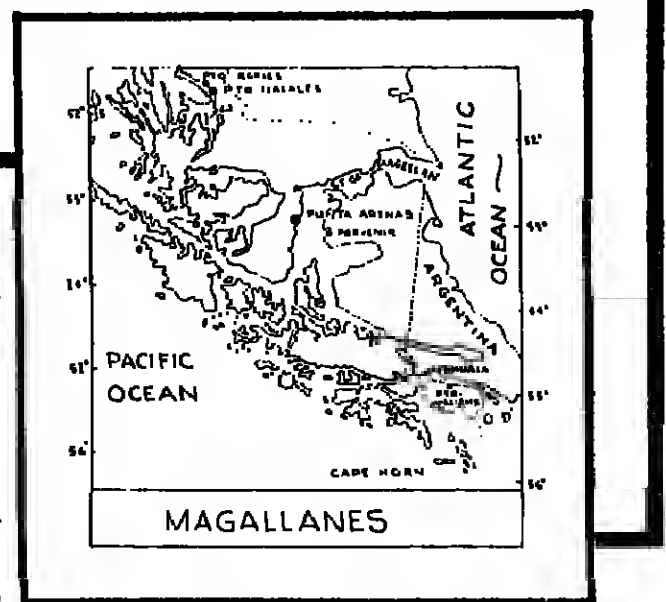
### Explanation

This analysis provides at least a partial explanation for the repeated failures of attempts to acclimatise true salmon in Chile. In all of the early attempts, salmon were released no further south than 42 deg. S. Any surviving transplantation, to migrate seaward, would have to merge with the Humboldt Current. They would thus be carried northward and offshore into the tropics.

The Japanese-sponsored effort being undertaken at Cuyinque (see FNI, January 1977) presents an interesting problem.

The Chonos Channels, through which the young salmon would probably move out to sea, may lie close to the northern limit of the divergence of the West Wind Drift. It is possible that if the young fish moved out to sea late in the Chilean winter, say in August, the northward seasonal shift of the divergence might carry its southward-moving limb temporarily to a position seaward of the Chonos Archipelago.

If this occurs, the young chum might be carried southward to favourable waters.



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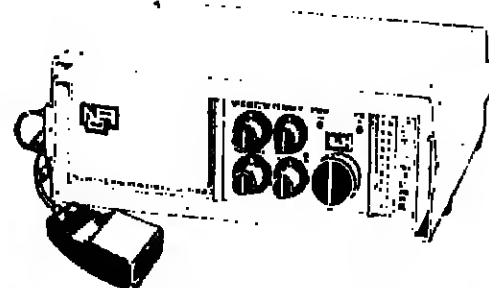
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## PORTS & MARKETS

### Turtle meat sausage and bangus buro

THE Mindanao School of Fisheries in Zamboanga City in the Philippines has developed processes for making a whole range of fish delicacies. They include turtle meat (loriuga) sausage, tuna sausage, bangus (milkfish) buro, corn-shrimp kropeck, and tenderised bangus French style. The school also produces a unique shark leather.

### Peru sells fishing company

PERU'S Ministry of Fisheries has sold 80 per cent of its shares in the canning and freezing company Pepsa to Peruvian buyers.

Pepsa operates out of the Piura port complex. It has been running at a loss and is reported to be virtually bankrupt. The Minister of Fisheries has sold that its 1,000 workers will remain on the payroll.

### Jobs lost

Pescapera, the state-owned anchovy processing company, has reduced the number of its workers from 25,000 to 6,000 over the past two years.

About 10,000 of the workers put off were fishermen. Many have been transferred to the small firms which bought the state company's fishing fleet.

According to FNI correspondent O. L. Vilasis, tortuga sausage is prepared from the meat of edible sea turtles (*Chelonia japonica*) which abound in the Mindanao Sea. Laboratory tests show it to be high in protein and low in cholesterol. And it is very tasty.

The shark leather is made from shark skins cured in lime and stained the desired colour.

### Black meat

White and black meat of the yellowfin tuna is used for the tuna sausage.

Corn-shrimp kropeck is obtained by grinding shrimps into paste with corn, instead of rice.

But the products which seem to offer the greatest possibilities for utilising a growing supply of raw material are the two made from milkfish.

Bangus buro is prepared by curing milkfish in salt for three days. The product is then packed in glass jars with a rice-soup mixture, and stored until fermented.



The shape of British fishing in 1977, and 1978. Two crew members of a large Scottish purse seiner prepare to transfer mackerel to a Russian factory ship (see story in last month's issue). The British mackerel haul nearly doubled last year, to 170,000 tons. Mackerel has replaced cod as the main component of the UK catch. The industry could take more than 200,000 tons in 1978, but may be prevented from doing so by an EEC-imposed limit of 132,000 tons during the course of the year.

### The shape of things to come?

## 'KING COD' LOSES HIS CROWN

THE morning landings into the traditional port market, the leed cod in kits or baskets, the auclon and all the bustle of a busy trawler port, may be passing for ever from the British fishing scene.

Today, idle ships and unemployed fishermen are grim reminders of the decline of British deepsea trawling. And the figures for 1977 show that the previously-dominant cod now takes second place in the volume of landings to the once-despised mackerel.

As FNI reported in January, mackerel fishing off the south-west coast is now a major seasonal activity. In addition to the fleet of small handliners and pair trawlers based on Cornish and Devon ports, there is an influx of Scottish small trawlers, Scottish purse seiners, and the big freezer trawlers from Hull and Grimsby.

Last year, while the cod catch fell another 30 per cent, from 212,000 to only 146,000 tons, mackerel landings nearly doubled, from 87,000 to 170,000 tons.

### Earned more

The landing value of the mackerel is reported to have more than doubled to reach £12 million. But cod earned so much more in response to the food demand, that it averaged a remarkable £520 a ton to grow £76 million, about the same as in 1976.

Because of the diversion into species such as mackerel, the UK industry in 1977 experienced only a 3.5 per cent drop in landings, from 933,000 tons in 1976 to 900,000 tons.

### Mackerel moves to top of British landings

As the White Fish Authority notes in its latest *Supplies Bulletin*, hunters are adopting a different pattern of fishing. And this is having its effect in the ability of many fishermen to continue supplying into high-price markets.

### New record

Last year the landed value of the smaller catch was up 20 per cent on that of 1976, from £209 million to a record £251 million.

But all this will do little to console the deepsea trawler owners who have had to scrap their ships, or the trawlermen without work.

## NEW PRODUCTS NEEDED TO SAVE PROTEIN

PEOPLE want food, not nutrition, said FAO fish marketing expert Siig Vaaland in an interview with the Norwegian newspaper *Bergens Tidende*. A large proportion of the fish harvested around the world was converted to animal feed. If this could be used directly for human consumption, much protein would be saved which is now wasted.

But, said Mr. Vaaland, this meant developing new products, and these should be capable of absorbing large amounts of fish in a short period and be suitable for conservation.

For such development, products will be needed which are presently regarded as unconventional.

The first step, according to Mr. Vaaland, is the elimination of the gutting process. Fish can be round frozen and there is already a market for them in West Africa. But it will need a freezing chain.

Minced fish is another possibility, and he sees Type B fish protein concentrate (increasingly available from Norway) as the very simplest product.

The problem was how to make products such as fish flour attractive in price and taste.

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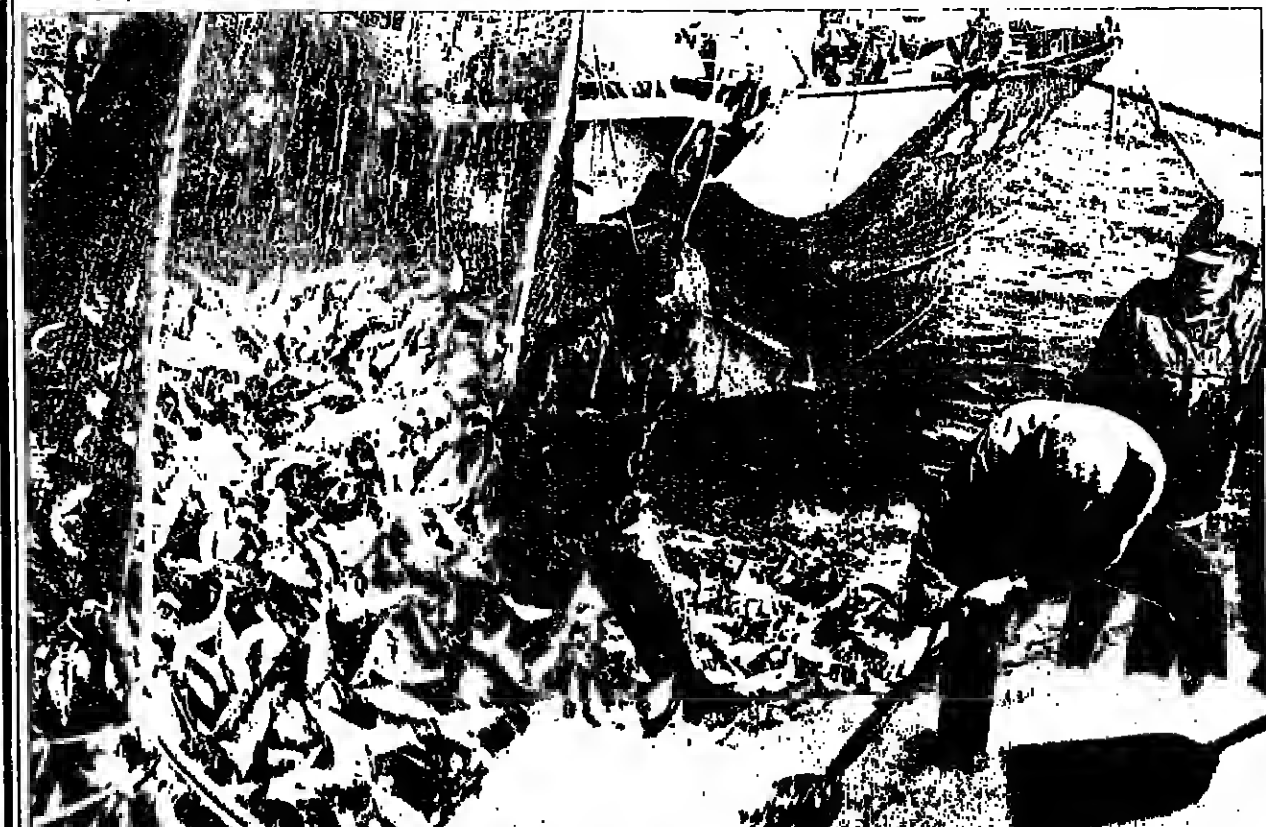


A fading scene in British fishing. Cod is landed at a trawler port to be auctioned. From over 400,000 tons ten years ago, the UK cod catch has fallen to 146,000 tons.

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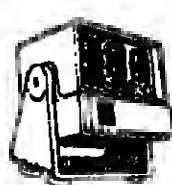
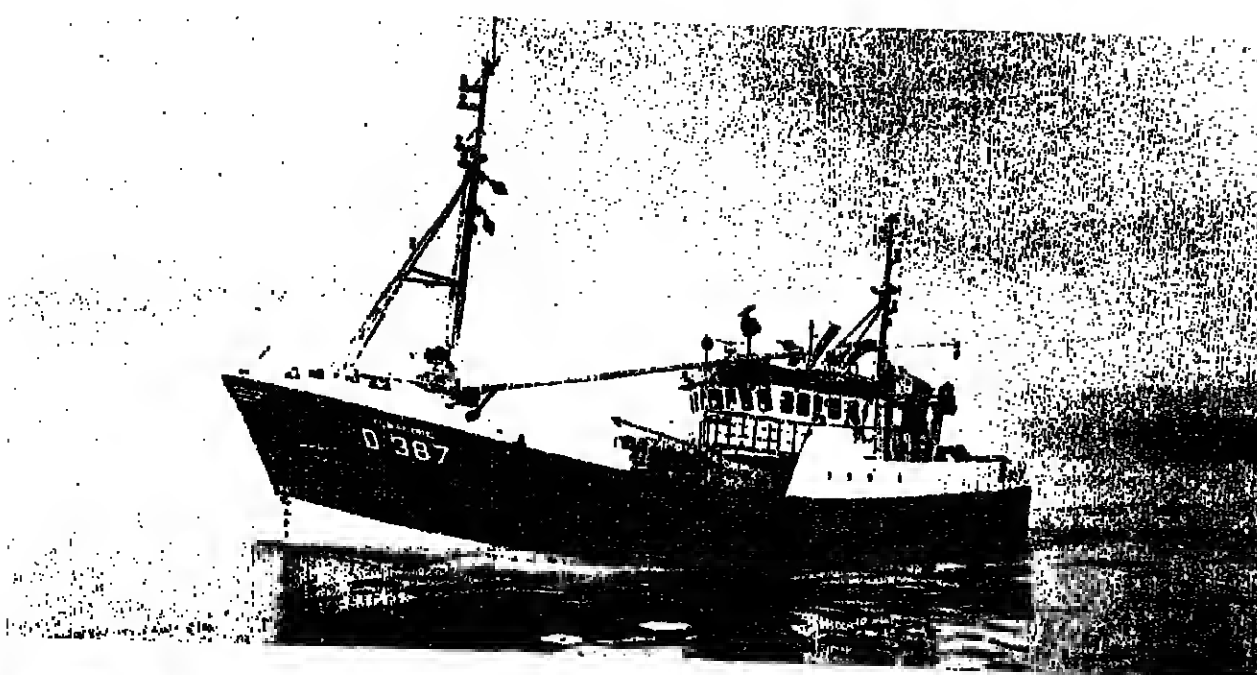


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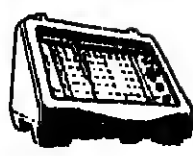


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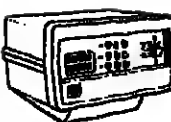
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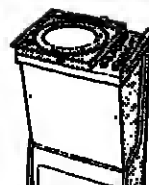
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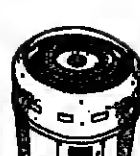
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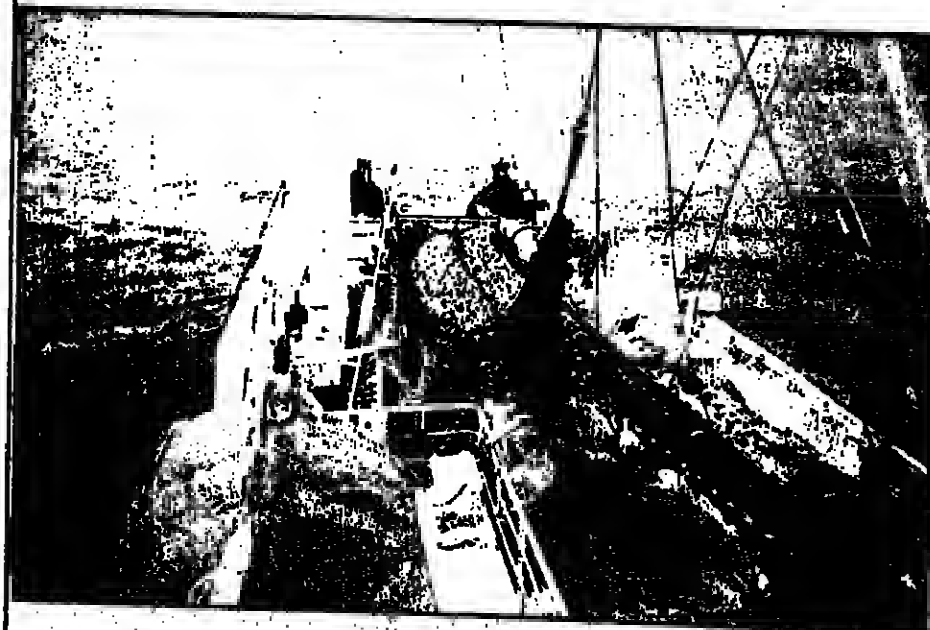




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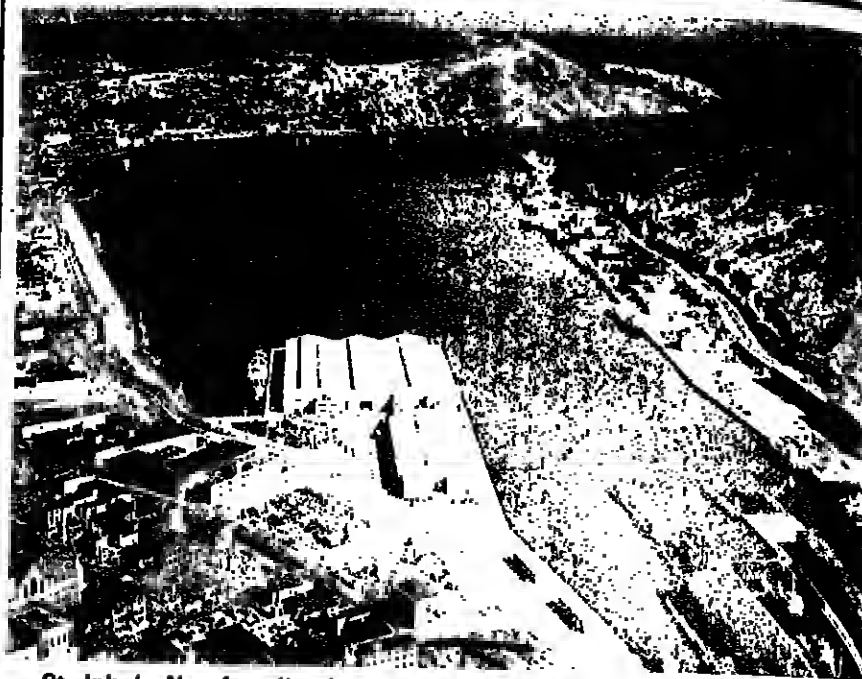
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## PORTS & MARKETS



St. John's, Newfoundland — long-term contract for repair of Russian ships

### Canadian ports out to attract foreign vessels

ONE INEVITABLE consequence of cuts in fishing by foreign vessels inside 200-mile economic zones is a loss of business for the ports of coastal countries.

This became evident on the east coast of Canada in 1977. There, as present law, foreign ships are not even supposed to be in Canadian ports. But the government has permitted them to enter for food and supplies and to give crews a rest.

Now fisheries officials are reported to be studying possible changes in federal policy which might encourage the foreign ships licensed to work inside the Canadian EEZ to make more use of local ports.

At one time, when there was great concern over foreign fishing off Canada, trawlers from outside were banned from getting repairs done, transferring catches or even changing crews while in port.

#### Not needed

"Now that we have real control out of 200 miles, we do not need this minor-league policy around any more," commented one official.

Aware of the struggling economies of a number of east coast ports, the government will probably carefully consider how they will benefit before giving any country increased port rights for its ships.

St. John's in Newfoundland could be one of the first to gain from the new development. The authority in charge there is trying to get a long-term contract for the repair of Russian fishing ships.

Halifax, where more than 2,000 shipyard workers face unemployment, could also benefit.

A change in port service policy will not require any special legislation. Control is within the Fisheries Protection Act and gives the minister responsible powers to alter access conditions. A memorandum on the subject is now being prepared for Fisheries Minister, Romeo LeBlanc.

Canada is believed to have told major fishing nations that access to port services could be written into bilateral fishing agreements.



Canadian east coast herring (right) and its North Sea cousin.

### Herring prices start to move

FISHERMEN of the Canadian east coast provinces of New Brunswick and Nova Scotia earned 11.8 per cent more for less fish in 1977. The 1976 catch of 116,800 tons dropped to 102,300 tons last year, but the landed value rose from 24.7 million to 27.5 million dollars.

The bulk of landings was herrings which dropped in volume from 75,300 to 61,900 tons but increased in value from 4.9 m. to 6.3 m. dollars.

The price of herring is rising fast as food outlets are found, and meal plant use declines. From an average of about 65 dollars a ton in 1976, New Brunswick fishermen earned just over 100 dollars last year.

But they still have a long way to go before they get the prices being paid for herrings on the other side of the Atlantic.

### Fish roe machine from Iceland

SEVERAL Norwegian purse seiner skippers are installing roe separators for capelin.

The plant was developed in Iceland by Trausie Eiriksson of the State Fisheries Laboratory. It has been used aboard Icelandic boats since 1973.

Norwegian importers, Jonsson & Odegard A/S, of Ski, said that in 1976 Iceland produced 1,600 tons of capelin roe which was sold to Japan for up to 1,700 US dollars a ton.

The North Norway company P/R Meloyværet has installed a separator on its new purse seiner Meloyværet at a cost of 230,000 kroner (£22,000). The roe will be packed and frozen aboard.

Another purse seiner, the Bodø Senior, has installed a 150,000 kroner separator.

This month the Norwegian company Njaard Hundels Industri Østfold, is installing a 500,000 kroner separator plant with a capacity of 250-400 tons of capelin roe during the spawning season.

### EXPORTS WORTH £410 m

NORWAY'S fish and fish product exports (including fish meal) in 1977 reached a record 4,100 million kroner (£410 million), compared with 3,700 million kroner in 1976.

Fisheries Minister Elvind Bolle said that, in spite of rising costs, Norwegian fish was still competitive in world markets.

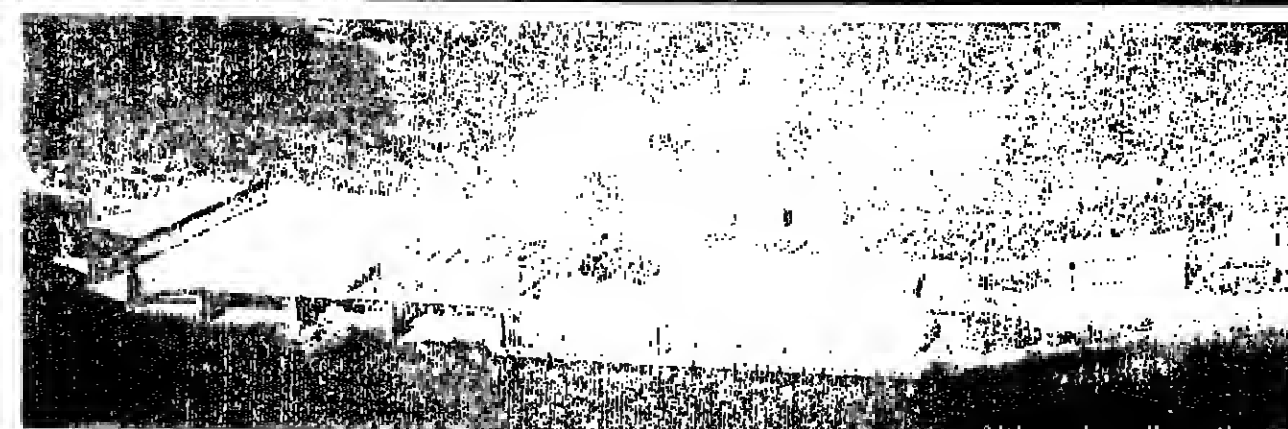
Demand was good, because of the wide introduction of the 200-mile zone, and the imposition of quotas and other catch restrictions.

According to Mr. Bolle, the Norwegian 200-mile zone has proved effective, particularly north of the 62nd parallel, where foreign trawlers have adhered to the quotas fixed by Norway.

### Multinationals move in

FIVE multinational companies have been issued letters of intent by the Indian government to process marine products, primarily for export. Four of them will also be permitted to import two deep-sea trawlers each, the exception being Cadbury Fry (India) Private Ltd.

The companies involved (with approved yearly processing capacities in brackets) are: Union Carbide (India) Ltd. 15,000 tons shrimp and 500 tons other marine products; Britannia Biscuit Company Ltd. 115,300 tons frozen fish and 5,400 tons fish meal; India Tobacco Company Ltd. (9,000 tons marine products); EID Parry (India) Ltd. 14,200 tons; and Cadbury Fry (3,000 tons).



### Record year for Norway meal

NORWAY'S important winter capelin fishery opened on January 12 in the Barents Sea. And for the first time a quota has been fixed. A fleet of 260 purse seiners and 181 trawlers is permitted to take a total catch of 11.5 million hectolitres (1,186,000 metric tons). In 1977 the winter capelin catch was 13.8 m. hl. and in 1976 it was 12.7 m. hl.

Last year's total Norwegian capelin catch was 2.1 m. tons with a first-hand sale value of 756.5 m. kroner (about £76 million). Capelin made up 67 per cent in volume and 26 per cent in value of the 1977 catch.

The Norwegian fish meal and oil industry based largely on capelin as a raw material had a record year in 1977. It handled 26 m. hl. of fish with capelin providing 21 m. hl.

Meal was strong in world markets, averaging around £260 a ton compared with £215 in 1976. The price of oil was £230 a ton compared with £197 in 1976. Meal and oil sales in 1977 amounted to 1,600 m. kr. (about £160 m.).

#### New markets

According to the director of the Norwegian Herring Sales Association, Japan and the Middle East are new markets for fish meal. And the demand from fish farmers and milk breeders is also growing.

With its sales up 300 m. kr. over the previous record year in 1976 the meal industry has been able to repay 145 m. kr. of the 225 m. kr. it borrowed from the state in 1975, when the market was depressed.

### KARACHI HARBOUR PLAN

A PLAN for expanding Karachi fish harbour has been prepared by FAO experts. It is being submitted this month to the Pakistan government.

The project will probably be financed with the aid of the Asian Development Bank.

Built in the late 1950s for 450 vessels to land 350 tons of fish a day, the harbour is now taking in about 700 tons from nearly 2,000 boats.

### More fish eaten

FISH consumption in Pakistan has increased by about 13 per cent in two years, from 43,000 metric tons in 1974 to 49,000 tons in 1976.

There was a smaller rise in exports, from 107,000 tons in 1974 to 114,000 tons worth US\$39 m. in 1976.

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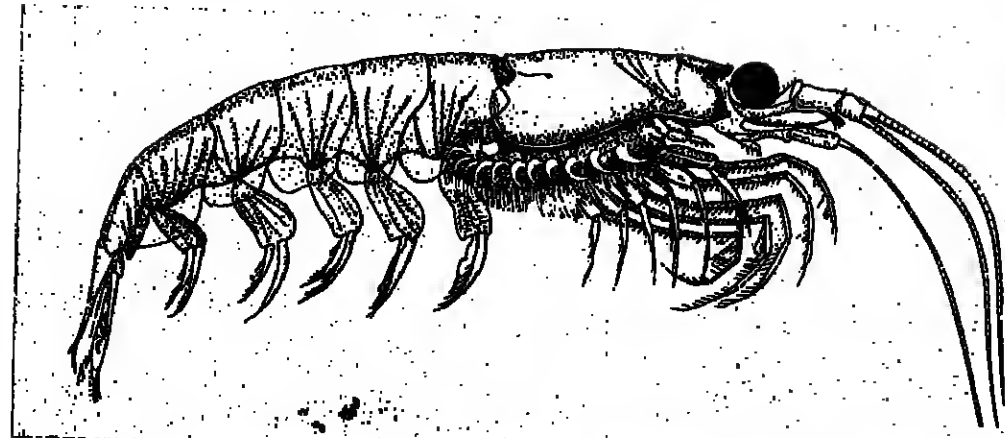
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# KRILL HUNT!

**One of  
three  
reports**

**Krill**—the small shrimp-like crustacean, food of the baleen whale—is the subject of what may be one of the most important resource development studies yet carried out for FAO. This study, "The Harvesting of Krill," was released last month. It is reviewed here by Peter Hjul in the first of two articles on krill and how it is being found, caught by mid-water trawls and handled by ships sent from Russia, West Germany, Japan, Poland and several other countries.

ARE THE huge stocks of krill in the waters of the Southern Ocean a viable resource on which to plan the development of a commercial fishery? Expeditions from the USSR, Japan, Poland, West Germany, East Germany, Norway, Chile and Taiwan have been going south to try and find the answer. It still eludes them. But much of what they have learnt has now been examined by a man whose many years of pioneering work in fisheries and knowledge of its engineering aspects have earned him the regard of fishing people all over the world.

Gordon C. Eddie, former technical director of the British White Fish Authority, carried out his survey at the request of the UNDP/FAO Southern Ocean Fisheries Survey Programme.

Briefly, he found that krill fishing commercially—judging from the available knowledge—will be a complicated and probably very expensive operation. It may have to be carried out by ships larger, more powerful and more spacious than any catcher presently in service.

Much still needs to be done both in the study of krill as resource and in developing products from it. Many estimates of what might be accomplished have to be based on assumptions and not on what is known and demonstrated. Eddie admits that the material presented "is inevitably incomplete and, in part, speculative." Given the present situation, the report could be rapidly rendered out of date by practical developments.

But out of the haze that has surrounded krill fishing, Eddie's cautious conclusions add up to the most encouraging of recent realistic assessments of the potential. Full-scale exploitation, he says, is not far off, at least at a modest level of annual catch. It probably will have begun by the early 1980s.

## Experiences

Also, certain principles are becoming clear from the experiences of the research expeditions, although Eddie does emphasise there has been no sustained fishing. Very few commercial ships and skippers and crews have actually caught krill. Enough is known, however, to allow informed speculation about future full-scale systems. It is also possible to identify some of the remaining problems that need to be solved or circumvented.

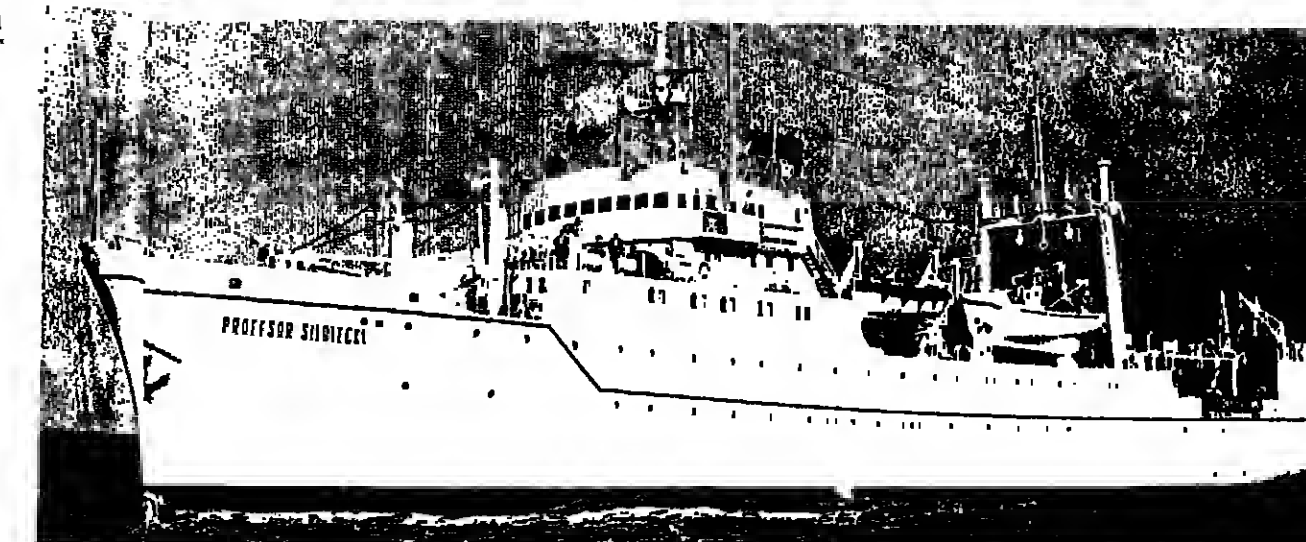
His report *The Harvesting of Krill* is difficult to summarise because it is written with a precision and an economy of words rare in such documents. It is, in itself, a model of what a fishery development engineering study should be.

He starts with an outline of the scope of the report, its economic and social considerations and the technology to be looked at. He then discusses its limitations, not the least of which was the difficulty of extracting information from some of those engaged in the probes. After a brief history of the fishery, leading to the present developmental phase, he goes on to the first of his main examinations—location and detection.

He follows this with a discussion of the methods of capture. As with detection, he concludes the section with an outline of possible further studies.

Having dealt with finding and taking the small creatures, he then reviews vessels and systems, dealing with technical and economic factors. He follows this with broader operation aspects in the difficult and remote environment. Finally, he speculates on possible krill fishing and processing systems—the ships that might be used, the cost and the product. His tentative conclusions at the end of this section are the furthest he takes this important study.

First, no type of system is ruled out on



One of the in krill fishing research—Poland's "Professor Siedlecki." This ship has led at least three expeditions to the Southern Ocean.

## Full scale fishing by early 1980s

technical ground might one day be fished by fleets of 25 to 30 metres long supplying shore floating factories. But the substance of the report suggests the most likely krill vessel—dependent super-trawlers and catcher trawlers served by supply vessels—created transports.

One particular feature of the report is that it goes into some detail in his discussion of the possible cost.

This, of course, is a rough estimate. As an example, a fleet of 150 tons a day was assumed. Trawlers would have to be deployed on the basis of a 10 million tonne a year. With support vessels, the fleet would cost 500 ships.

Speculation on possible systems are necessarily highly point to the need to know more about the factors which will govern handling.

The one that is caught krill will be the rate of catch rates. The evidence, the time for krill. And catch limit may be expected to appear to be.

Methods of detecting krill are by its best-known and previous pattern. It has a reddish-pink or brown habit of swimming at the surface of the sea in strips many metres long.

## Vertical

Until recently, it was widely believed that these creatures were always at or near the surface. But by the 1970s it was being learnt that they could move more frequently

from the hunting ship. For actual detection, it seems to be the most effective method with a preferred frequency of 10 to 20 Hz.

At depths of 100 to 200 metres, a sounder at 10 kHz has been found

useful to indicate which of the krill swarms are of high density.

Norwegian experience has been that Arctic (northern) krill can be detected by sonar at ranges of 500 to 1,500 metres. But Eddie notes that there is no indication that sonar has been found to be useful for initial detection of Antarctic krill, as distinct from its use in actual operations of aimed mid-water trawling or purse seining.

Surface swarms are seen at times but krill has been caught in large amounts in depths down to 300 metres.

This vertical movement of the krill down the water column seems to be an important influence on methods of capture.

## Mid-water trawl

But, in addition to what was learnt about depth of swarms, it has been found that krill are capable of little or no effective action to avoid incoming nets of the dimensions commonly used in full-scale trawl fishing.

In most of the recent expeditions, the single-boat aimed mid-water trawl has been the standard krill fishing gear.

In the 1975/76 German expedition—with the *Walther Herwig* and the *Weser*—a four-panel net was used. When fishing, this had an effective area of mouth opening of less than 400 sq. metres.

The Japanese expeditions have been using a six-panel net with an opening of 500 sq. m. Eddie compares these dimensions with those of up to 2,000 sq. m. for some large mid-water trawls in other fisheries.

The reason for the small size of krill trawls is the high drag from the small mesh. The German trawl, for example, absorbed the full power that could be developed at trawling speeds by the 3,000 hp *Weser*.

Mesh sizes used by the Russians have been down to 8mm (stretched). The Japanese JAMARC trawl of 1975/76 had meshes of 13 to 20 mm. The Germans used nets of 12 to 20 mm, and the Poles 12 to 24 mm.

With such mesh sizes, the net has to be made of very fine twine to reduce drag—in the range R400 to R1200 lcx.

Such a net needs to be made of unconventional materials or else reinforced to give it adequate strength. At present this is done by using the krill net proper as a liner inside a net of more conventional mesh and twine sizes.

Ships working this gear have already taken some very big catches. Eddie later devotes several pages of his report to an analysis of catch rates and how these might be related to more sustained commercial trawling.

It has not yet been proved that larger trawls will take more krill. There is a suggestion that the optimum depth of trawl opening may be around 20 metres (the dimension of the German

GORDON EDDIE's study *The Harvesting of Krill* is one of three reports produced by the UNDP/FAO Southern Ocean Fisheries Survey Programme. They cover, says Programme Co-ordinator E. S. Holliman, various aspects of possible fisheries development in the Southern Ocean. The first and largest of the reports is by Dr. Inigo Everson who is a staff member of the Life Sciences Division of the British Antarctic Survey in Cambridge, England.

He considers fin fish, krill and other possible commercial fishery stocks in the Antarctic region.

His report is the longest of the three. With maps, drawings, and a large reference section, it runs to 156 pages.

The largest single part of it is devoted to a biological study of krill drawing on the literature already available. Although at least six

species of euphausiid crustacean are common in the region, Dr. Everson concentrates on *E. superba*. This, he explains, is the largest and most abundant and is the species "most generally considered as being synonymous with the term Antarctic krill."

## Utilisation

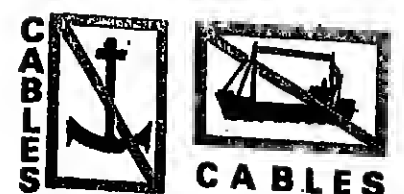
In the third report G. J. Gnantham, over 62 pages, reviews available information on the technology of krill utilisation. He notes that, while process and product development is going ahead rapidly, no one obvious product has emerged.

Use will probably vary from country to country, and products that evolve may be sophisticated and costly. Assistance may therefore be necessary to develop alternative technologies and products suited to developing countries.

Part Two next month will deal in more detail with the main features of the reports by Everson and Gnantham. We shall also outline development prospects considered by Eddie.



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## BOATS &amp; BUILDERS

## Danish fishermen given grants to fit propeller nozzles

THE Danish government is providing grants to fishermen who fit nozzles to their boats, reports Dag Pike. The move, which is part of a complete energy saving package, is providing considerable work for shipyards and nozzle manufacturers.

The fuel saving theory is that a vessel with

nozzle can either pull a larger trawl with the same engine power or can pull the same trawl without using the engine at full throttle.

Hard times have hit the Danish fishing industry at present, with many of its traditional grounds either closed or on strict quota.

Fishing vessel owners appear to think that this is only a temporary situation because, although they do not seem prepared to invest in new boats, they are taking advantage of the fishing lull to get their vessels modernised.

Propeller nozzles are just one part of this modernisation. Many vessels are fitting new wheelhouses and new deck equipment.

Alpha Diesel which supplies a large proportion of the Danish fleet with engines, reports a considerable increase in re-engining. In the absence of new construction, this is providing work.



Refit and overhaul work has been helping to keep Danish yards busy.

## Eliminate clutch linkage wear with Twin Disc's Marine Front PTO.

Twin Disc offers a Power Take-Off specially designed to meet the severe demands made on front-end PTOs in commercial boats. It's the Twin Disc Model SL Marine Front PTO.

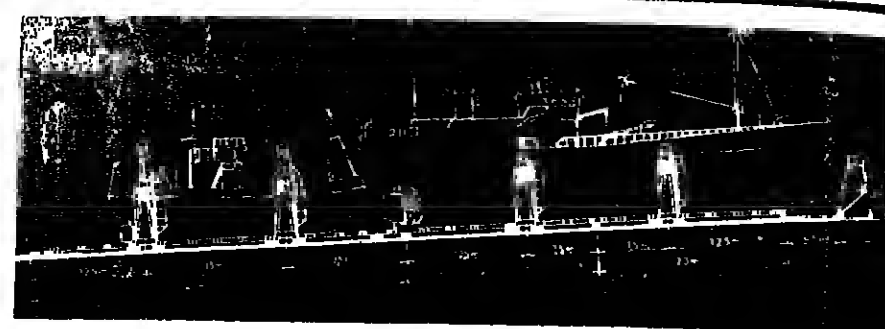
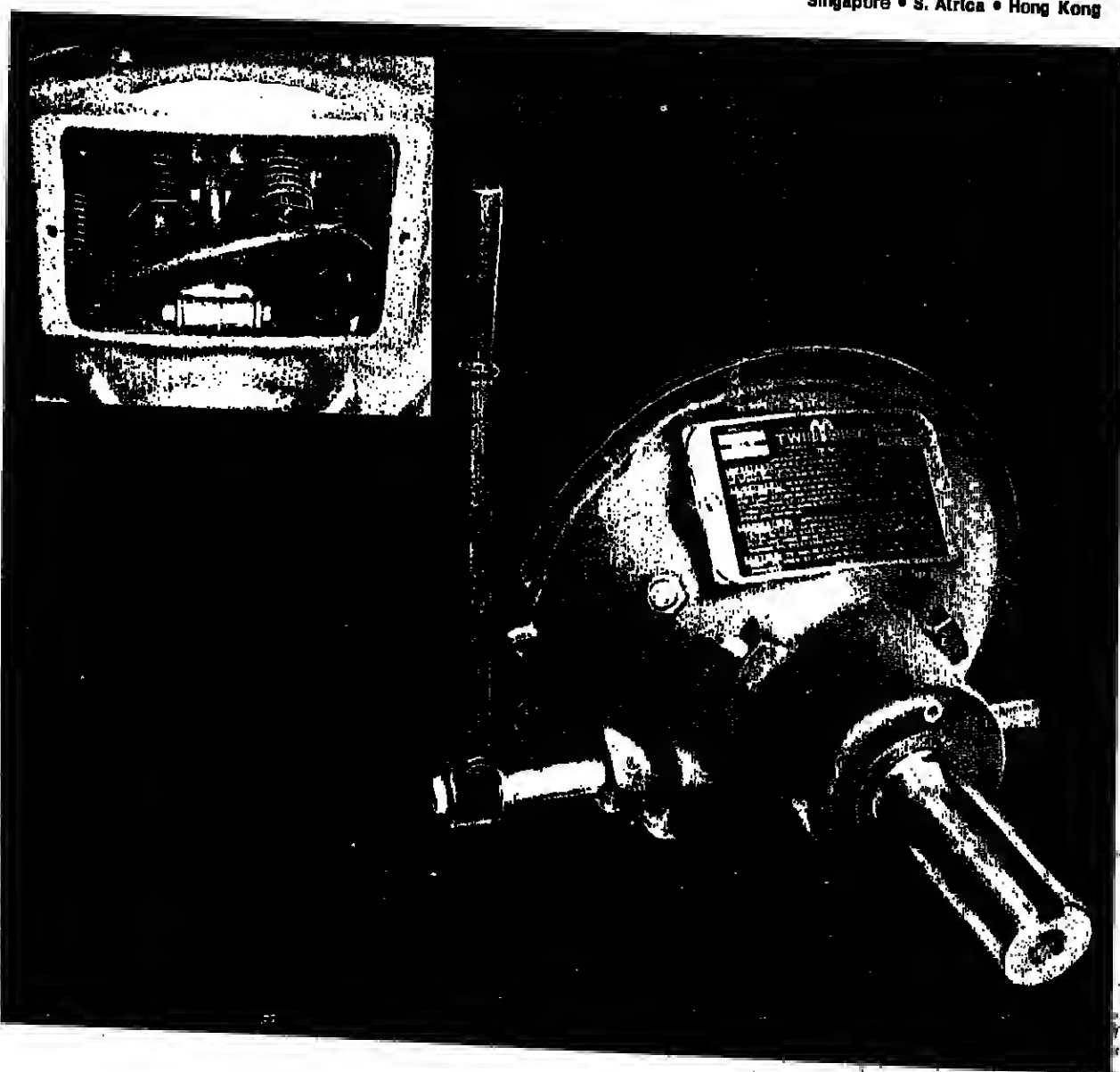
Conventional front-end mounted power take-offs are designed for use when the clutch is engaged most of the time. But the linkage wears out when the clutch runs disengaged for long periods. Twin Disc's spring-loaded overcenter Marine Front PTO eliminates both this wear problem and the need to adjust the clutch.

The Twin Disc Model SL PTO is not merely adapted from standard PTOs. It was developed specifically for application on front of an engine. Designed and tested at sea, the unit proved superior in eliminating wear and tear of the clutch linkage. This unit is available in one-plate and two-plate, 11-inch plus two-plate, 14-inch designs.

For complete information on the Twin Disc Model SL Marine Front PTO, see your Twin Disc or marine engine distributor.



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## Support towers keep vessels upright on the slipway

Sverre Munck Aksjeselskap, Bergen, NORWAY

AT ITS repair yard in Maaloy, Norway, A/S Baatbyg has designed and developed a way of avoiding many of the problems of handling fishing vessels out of water in conventional slipway systems. Basic to the new method are two short towers mounted on each side of the slipway truck (wagon).

A/S Baatbyg now uses the method, and it has sold the manufacturing and marketing rights to the firm Sverre Munck A/S of Bergen.

In the conventional system, explains Mr. Svein Milford, marketing manager, the vessel is supported out of the water by wooden blocks conforming to its hull shape. Fitting these blocks is time consuming and has to be done while the truck is out of the water.

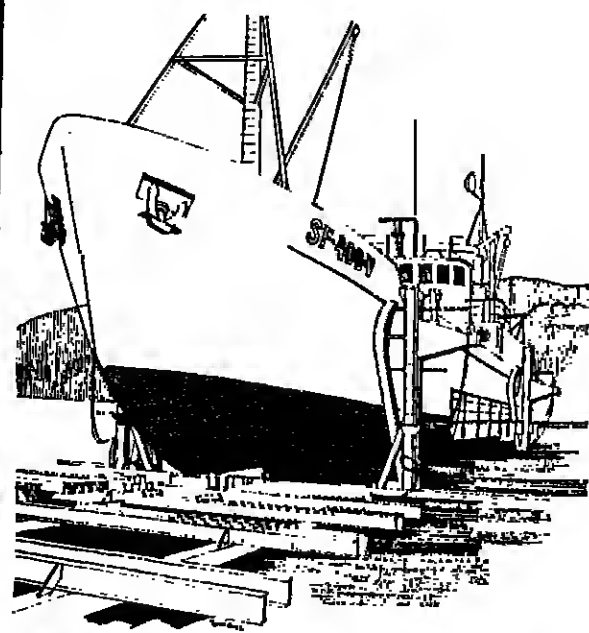
Another difficulty is that the blocks obstruct cleaning and painting of the hull, and complicate changing of plates and other repair work.

In the new system, the vessel rests on keel blocks and is supported by the towers on each side of the slip truck. A vertical arm hinged to the bottom of the tower is forced against the ship's side by an hydraulic cylinder at the top. It is mechanically locked when the vessel is firmly in place.

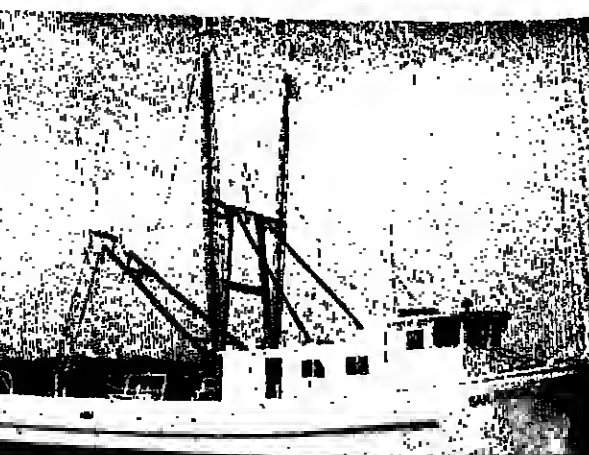
The tower arms are controlled from a platform mounted at the front of the slip truck. The towers can be adjusted sideways according to the shape and dimensions of the hull.

One of the most interesting features of this system, is that most existing slip trucks can be adapted to take the towers but some may need to be strengthened.

Further information from Sverre Munck A/S, P.O. Box 3151, 5001, Bergen, Norway.



This drawing shows a vessel on the slip with the support towers alongside.



BUILT for export by Desco Marine, the 68 ft (20.7 metre) long "San Miguel II" will operate with a sister boat, the "Jiboa II", in Central American shrimp grounds. The boats are for Distributor Marina S.A. of Puerto El Triunfo, El Salvador.

They are of Desco's standard "wood and glass" design, with GRP hull and timber upperworks and deck. The main engine is a Caterpillar D3406 diesel developing 275 hp and turning a Columbian fixed pitch propeller through Twin Disc 4.5 to 1 reduction.

## Yard provides boats, nets, ice and jobs

CEY-NOR boatyard, Karainagar, SRI LANKA

AT KARAINAGAR on the Jaffna Peninsula of north Sri Lanka is a busy boatyard started by donations from the young people of Norway. It now has some 400 workers turning out 15 boats a month.

The story of the CEY-NOR boatyard and related fishery activities goes back more than ten years to 1967. A few young men from Jaffna were on a private visit to Norway; there they met members of Norges Godtemplar Ungdomsforbund (NGU) and told them of the needs of coastal communities in the north.

Director Svein Loesnaes of CEY-NOR describes the meeting as a "coincidence." It led to an initial study and an early project modestly based in a single hut. From it has grown an operation which is doing much to improve the lives of poor fishing communities along the lonely coast around Karainagar.

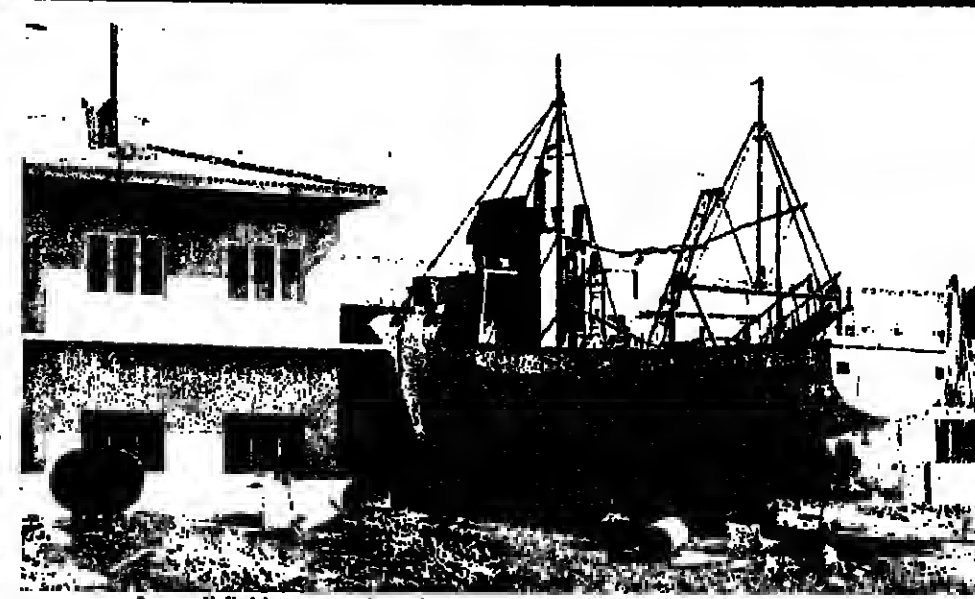
The initial yard proved so useful and grew so fast that in the early 1970s the Sri Lanka government became interested in it and appointed two members to its board.

The yard specialises in production of GRP and ferrocement boats under the direction of Harry Hermanson, an American of Norwegian descent who serves in the project as a consultant and alternate director to Svein Loesnaes.

There is no difficulty finding buyers for the boats. Most have proved a sound investment for their owners and some have earned their capital cost in only two years.

The yard's production is mainly small GRP craft, but also includes 32 ft ferrocement boats, which are rather cheaper and are popular in the yard because their construction is labour-intensive.

Now nearing completion is a 48 ft (14.6 m) boat. This will



A small fishing vessel under construction in the CEY-NOR yard.

## Report by NALIN WIJESEKERA

cost its owners about Rs. 1.25 million (£90,000) when its sophisticated equipment and 200 hp engine are fitted. But it still represents a big saving as an imported boat of the same size and capacity would cost about Rs. 2.5 m. And its construction required 14,000 man-hours of labour in an area in great need of work opportunities.

Also taking shape in the CEY-NOR yard is a 62 ft (18.9 m) long boat to be used for training in modern techniques by the Sri Lanka Department of Fisheries. All mechanical devices in the boat (which can accommodate 15 trainees and a six-man crew) were donated by Japan.

Another value of the Karainagar project for the

fishermen of the Jaffna Peninsula is its maintenance service. A team of mechanics travels around the coast to repair and recondition boats from Mullaitivu to Munnar and from Port Pedro to Peralai.

The yard and its service mechanics, however, is just one CEY-NOR project. There is an ice-making plant in Karainagar. And at Gannar 14 machines work almost 24 hours a day in three

shifts every day of the week turning out 1200 nets a month. The net plant employs 140 men and 56 women.

Young people in the area quickly learnt to use the simple machines which were brought in second-hand from Norway. The work is labour-intensive, but, again, doubly valuable because it provides employment.

Foreign exchange from this export from the net factory plus that from exporting processed prawns to Denmark is used to buy in spares and other components.

The prawns come from catches taken by CEY-NOR trawlers. The rest of the catches, amounting to about 50 tons a month, is sent to the Fisheries Department in Colombo for sale. The Karainagar ice plant turns out 12 tons of crushed ice a day for use by the trawlers and in the prawn processing plant.

A few months ago government withdrew its stipulation that every imported boat should be matched by one in India. Since then five new have sought approval to import trawlers from Mexico, ranging from 23 to 30 metres long.

## India may phase out trawler imports

REPORTS in the Indian press indicate that the central government may decide to boost its subsidy for the construction of fishing vessels.

The present subsidy is 2 per cent of the cost of equivalent imported vessel.

A report in the *Economist Times of New Delhi*, also states that the government is considering a phased ban on trawler imports as part of a overall plan for deeper fish. Two factors are said to be influencing moves for a ban. One is the large number of complaints about defects in imported trawlers. The other pressure from local boatbuilders who say their facilities for trawler construction are neglected.

## Buy designs

Already, local yards allowed to buy in designs suitable vessels from outside. The Shipping Development Committee is empowered to provide loans on terms slightly more generous for locally built than for imported boats — per cent of the cost, against per cent.

A few months ago government withdrew its stipulation that every imported boat should be matched by one in India. Since then five new have sought approval to import trawlers from Mexico, ranging from 23 to 30 metres long.

## 'Unsinkable' dugout for Nigeria

Shetland Boats Ltd., Suffolk, ENGLAND

SHETLAND Boats Ltd., of Suffolk, England, are making a carrier boat for Nigeria. They have named it *Shetland Dugout*.

"We have given it this name," explained Mr. J. F. Stokes of Shetland Boats, "because it really replaces the dugout in Nigeria as a general cargo carrier."

The boat is 5.7 metres long overall and 2.43 m wide.

An immense amount of closed-cell polyurethane foam (26 cu. ft.) means that the boat is virtually unsinkable," says Mr. Stokes.

It is designed for use with single or twin outboard motors.

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## BOATS & BUILDERS

### Versatile new 'Seafarer' built to Irish Fisheries Board standards

Crosshaven Boatyard, IRELAND.

THE *Seafarer* is a new class of multi-purpose wooden boat, designed by G. L. Watson of Glasgow. She was built by the Crosshaven Boatyard in Ireland for an Irish owner, Mr. Noel McDonagh of Dunmore East in County Cork.

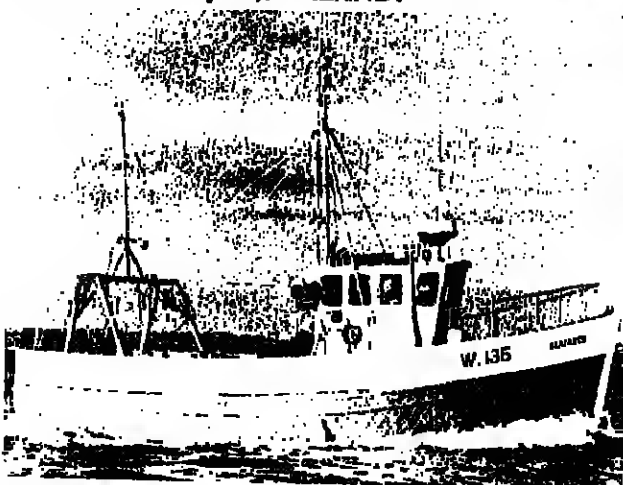
With a length of 39 ft. 10 in. (12.1 metres) overall, she is 38 ft. on the waterline, has a beam of 15 ft. and moulded depth of 7 ft. 4 in.

The teak-on-oak boat has been built to the stringent standards of the Irish Sea Fisheries Board.

She is equipped for stern trawling, drift and gill netting.

The *Seafarer* is powered by a Gardner 6LX diesel engine developing 110 hp at 1300 rpm with 2.95 to 1 reduction to give a speed of eight knots.

Deck equipment includes a Pifer 1.25 ton trawl winch and a Hydema power block for hauling drift nets.



'Seafarer' — a G. L. Watson designed prototype.



'Boston Sea Vixen' — first of a four-boat class.

### Compact trawler prototype

Richards (Shipbuilders) Ltd., Great Yarmouth, ENGLAND.

THE *Boston Sea Vixen*, first of a new four-boat class of compact stern trawlers for Boston Deep Sea Fisheries Ltd., ran trials in January from the yard of her builder, Richards (Shipbuilders) Ltd. of Great Yarmouth, England. This new class is being built at a total cost of about £3 million. The vessels are equipped with hydraulic powered split winches and net drums for bottom and mid-water trawling.

With a length overall of 86 ft. (26.2 metres), the *Boston Sea Vixen*, has a registered length of 79 ft., moulded breadth of 25 ft. and moulded depth of 12 ft. 6 in.

The main engine is a Mirreless Blackstone diesel developing 700 bhp at 700 rpm and turning a controllable pitch propeller through a reduction gear.

Her Hydraulic Brattvaag low pressure split winch incorporates the Synchro 1010 control system.

Accommodation is provided for a crew of up to eight men. This class is a development of the earlier *Boston Sea Knight* series of small, compact trawlers designed to work out of the North Sea port of Lowestoft.

Speaking at the launching of the *Boston Sea Vixen* in October, Mr. Neil Parkes, deputy chairman of Boston Deep Sea Fisheries, said that the *Sea Knight* trawlers had proved highly successful.

They used 40 per cent less fuel than the larger trawlers they had replaced and their catch figures were just as high.

### Danish yard delivers stern trawler to Faroe Island fishing concern

Karstensens Skibsværft, DENMARK

THE POLITICAL links between Denmark and the Faroes are paying off for Danish shipyards in the form of orders from the islands. The most recent delivery is a 25 metre trawler from the Skagen yard of Karstensens Skibsværft. This follows on from earlier orders for three wooden vessels.

Steel built, the *Brimborg* is for A/S Borgaknappur of Vagur. She has a beam of 7 metres.

Her design features a small stern ramp on the starboard side of the transom. The wheelhouse is offset to port allowing a clear lead from this ramp to the winch forward. A shelter is fitted over the port side of the foredeck.

The engine is a 850 hp Caterpillar diesel which drives through a Twin Disc gearbox. Speed is 11.5 knots. The hydraulic pump and many of the auxiliaries are driven from the front of the engine. The propeller is fitted with a nozzle. The trawl winch is a Rapp 10-ton model and the vessel is primarily equipped for mid-water trawling.

Wheelhouse equipment includes a Furuno radar and Simrad echo sounder.



The 'Brimborg' at Skagen before she sailed for the Faroe Islands.

### New Polish research ship on krill trip

Gdynia Shipyard, POLAND

NOW OPERATING with the Polish fleet engaged in krill fishing in Antarctic waters is a new trawler-type fisheries research ship called the *Profesor Bogucki*.

In dimensions and appearance, this ship is the tenth of the series of B-417 type factory trawlers from the Gdynia Shipyard. But her design was adapted to enable her owners, the Sea Fisheries Institute in Gdynia, to carry out research and experimental work mainly into catching methods and processing.

She has an overall length of 89.88 metres, width of 15 m. and depth of 8.39 m.

The 2,374 gross ton ship is propelled by a Polish-built 3,600 hp engine which gives her a speed of 15.5 knots.

She has a crew of 70 and carries a scientific staff of 12.

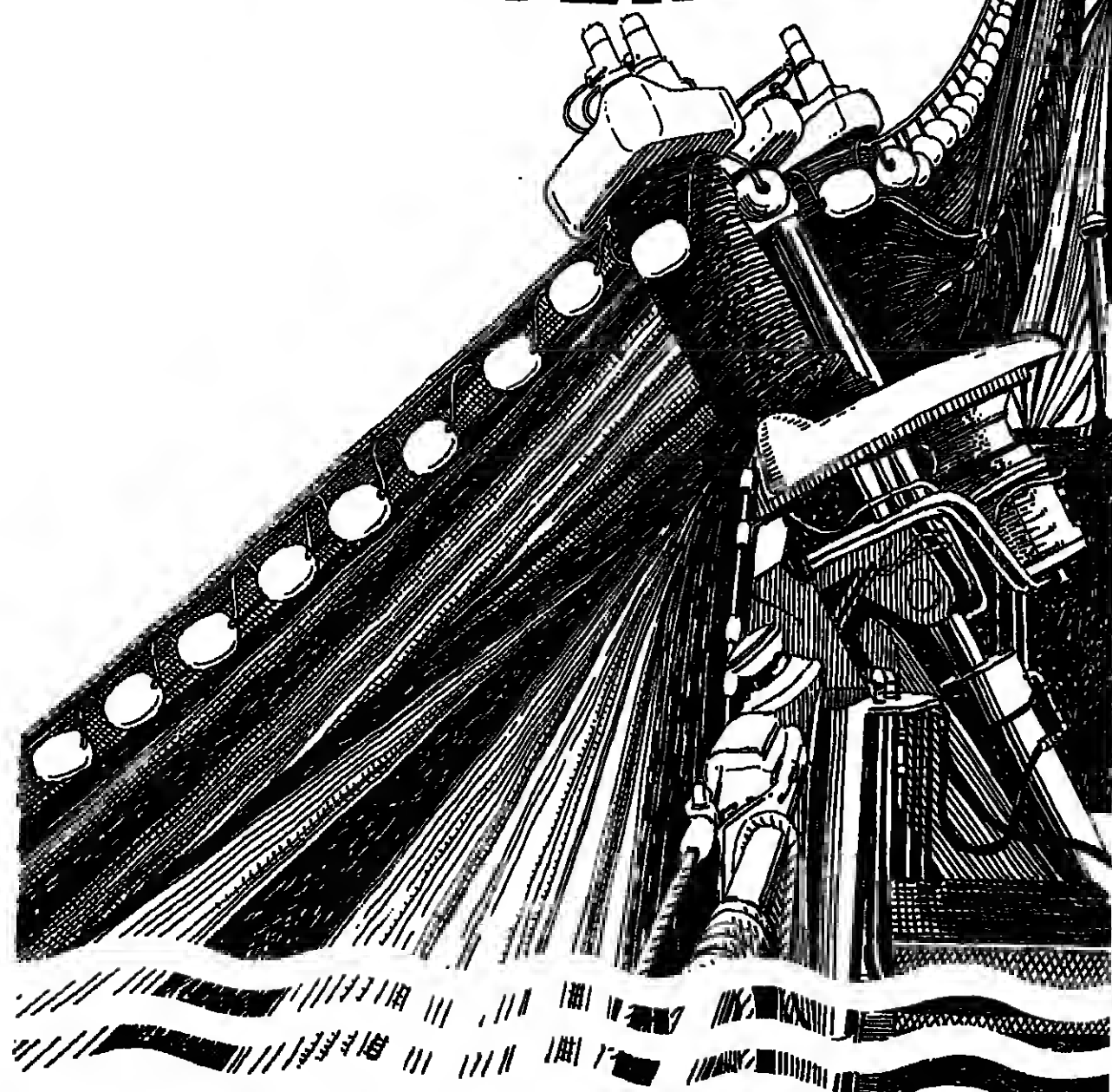
### Four from IMESA

FOUR Mexican-built shrimp trawlers have arrived in Calcutta and are now fishing off the coast of West Bengal.

The vessels are 23 metres long and displace 153 tons. Each cost about £250,000. They were built by the IMESA yards in southern Mexico.

Four Indian-built trawlers of the same size will also be supplied to the state fisheries corporation, which plans to export four-fifths of catches.

## PURSE SEINING



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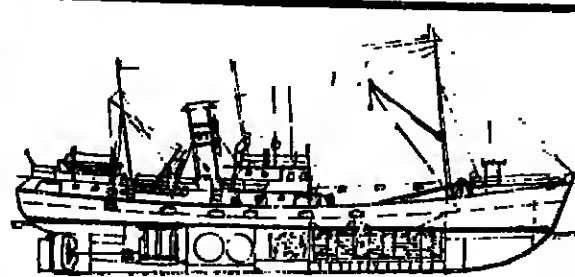
Roller fitted with replaceable rubber coated cylinders.

TRIPLEX NET WINCH delivered now in three sizes:

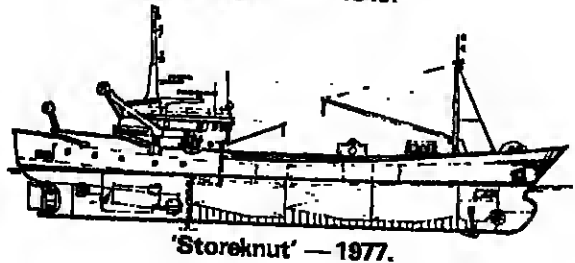
Type 380/226 with theoretical net pull 1.5 and 3 tons.

Type 504/300 with theoretical net pull 4 and 6.5 tons.

Type 603/360 with theoretical net pull 15 tons.



'Storeknut' — 1949.



'Storeknut' — 1977.

### 30-year-old purser 'as good as new'

Trondhjems Mek. Verksted, Trondheim, NORWAY.

A MAJOR renovation job in a Norwegian yard has given Ole Dronen a purse seiner which he finds as good as new, at a third of the cost of a ship built from the keel up.

The work was done to the *Storeknut*, built by H. C. Stucklen Sohn in Hamburg in 1949 as a side trawler 48 metres long.

It involved replacement of the whole fore section of the ship, installing a shelterdeck and increasing the beam by 1.5 metres. The cost was 4700,000.

The new fore section was built by Trondhjems Mek. Verksted of Trondheim. Design work was by Skipskonstruktør A/S of Bergen.

As a result of the changes, the ship's laden capacity has been raised to 9,500 hectolitres. Stability is reported to have been improved and freeboard increased.

Deadweight is now 1,500 tons and gross tonnage has been raised from 600 to 750 tons.

Over her busy life of nearly 30 years, the *Storeknut* has gone through several changes. In 1969 she was converted from steam to diesel propulsion. In 1966 ballast tanks were installed and other improvements made. In 1973 she was lengthened and the main deck raised. In 1976 the superstructure was replaced.

### Launching troubles for £2m. trawler

Skipsverftet, Sandnessund, NORWAY

SINCE September 1977, several unsuccessful attempts have been made to launch the hull of a 20 million kroner (£2 million) trawler being built by Skipsverftet in Sandnessund.

### VETERAN NEARS THE END

THE Norwegian government has asked Parliament to vote 20 million kroner (about £2 million) for the construction of a new 150 ft. (45.7 m.) long research vessel to replace the ageing *Peder Ronnestad*.

Built in Hamburg in 1948 as the *Spitzberger*, this 126-ton, 26 metre long vessel had her name changed in 1952 and has done valuable work for the Fisheries Directorate in Bergen for more than 25 years.

This year she has another full programme of work, including the marking of mackerel in the North Sea and Skagerrak during July and August.

### Norway help in India

NORWAY is providing money and technical assistance for the building of eight vessels to survey resources and train technicians in the Indian fishing industry.

Two of the vessels are under construction by Goa Shipyard. The survey vessels will be operated by the Exploratory Fisheries Project in Bombay.

Weather, wind and current have all seemed to conspire against a successful launching. Ordered by Oddvar Johansen Majala of Høyvåg, the trawler is to be fitted out by another yard in Harstad, when she can be got into the water.

But the delay has already prevented the ship taking part in the lucrative winter capelin fishery, as was planned. And the unfortunate Sandnessund yard is having to pay compensation to the owner at a daily rate.

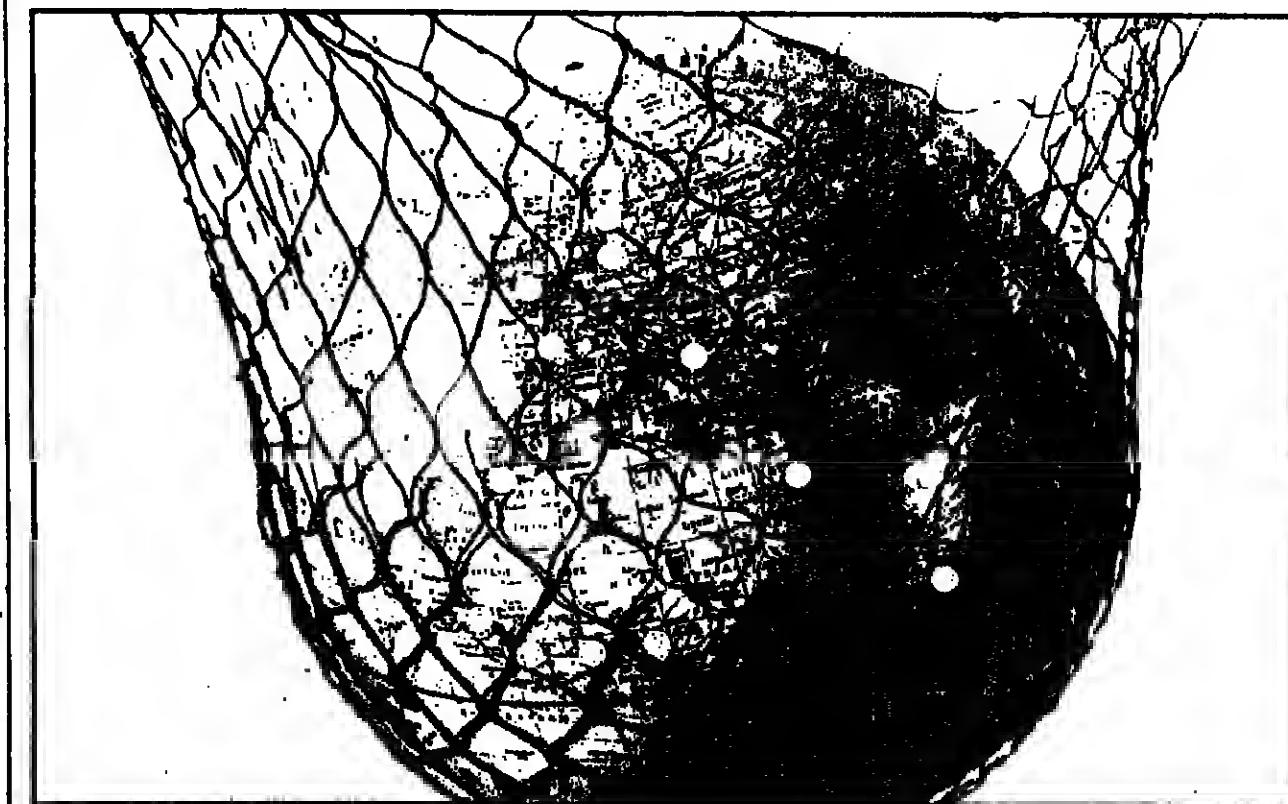
### Trawler hull came from Scotland

THE Norwegian yard Rabben Mek. Verksted of Bekklavik has delivered its first trawler, the 122 gross ton *Tjelvåg*, to owner Ole N. Midtveit. The hull was bought in Scotland and formerly belonged to the fishing vessel *Honey Dew* 77 built by Smith & Hutton in 1974.

Designed for industrial fishing in the North Sea, the *Tjelvåg* is 26.2 metres long overall with a moulded breadth of 6.7 m. She has a capacity of 1,300 hectolitres.

Her 725 hp engine gives her a speed of 11 to 12 knots.

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# from the dockside

CHOOSING A TITLE for a new column is rather like naming a baby. Whatever the choice it sticks for the life of the column, the columnist, or the baby. But there is one difference — columnists can be changed and, with them, the title. Not wanting that, I sought advice with great care. I was so careful that I had a column but no name for it when we were ready to bring out our first new-style FNI.

Collectively, we thought over and threw out *From the Codend*, *Off the Hook*, *In the Bag* and many others.

Then, a few weeks ago, American skipper Barry Fisher came to London from Hull (where he took part in a gear training course). He was on his way home to family and fishing boat in Newport, Oregon. Barry is a man for the apt phrase, and most times he delivers it on the right occasion.



Side trawlers can still be top earners. Built in 1968, the 225-ton Suffolk Chieftain set a Lowestoft record with £259,000 in 1977.

"Where," I asked him, "would fishing people expect to hear a range of topics talked about — from searching for fish, to catching it, through processing to problems of research and administration."

"Only one place," said Barry. "On the dockside."

So the column got its title. And Barry Fisher got a lunch.

Over the meal he told us about an argument between a skipper and a marine biologist.

Having been informed by the biologist that when five fishermen get together you get five different opinions, the skipper pointed upwards to the white trails feathering out behind a jet airliner five miles up. "See those," he said. "There goes a fishery biologist turned crop sprayer."

Turning to speculation, you will have seen the report last month that the pilchard catch off Namibia, and landed at the port and canneries of Walvis Bay, will probably drop to 125,000 tons this year, from an average of 500,000 tons a few years back.

This is bad news for importers of South African pilchards. But perhaps there is no need for panic buying. More than 25 years ago there was another collapse in a pilchard fishery. The sardines (pilchards) that fed Canary Row of Monterey in California dwindled away, never to return in any real quantity.

But at that time pilchard canneries were growing up in South Africa, and Walvis Bay. The American canners had put brands on the market, and on the market those brands remained although the fish in the pack no longer came from California.

Part of the Southern African pack still gets on the shelves under brands of packers far removed from the desert shores of Walvis Bay. So I think the talk of Southern African fishing company interest in a cannery or two in Peru is more than just a rumour.

As anchovy have declined, competitors in the rich waters, such as the sardine (pilchard), seem to have gained strength. Last year, to feed meal plants, thousands of tons of sardines were caught. They would be better used by canneries with the capacity, the efficiency, and the market outlets of the pilchard-starved plants of Walvis Bay.

## Fears over a new 'Spanish Armada'

While the eight fishing countries in the European Community squabble over who gets what, how much and where, some are looking appreciatively south at two of the four possible new entrants.

At a press conference in London, White Fish Authority chairman Charles Meek noted that the applicant countries would add about two million tons to the EEC catch. But he was more concerned with the fact that, of 842,000 gross tons of fishing ships larger than 100 tons, no less than 710,000 tons is owned by Spain and Portugal.

This fleet, he added, "has been dramatically increased in the past three or four years at a time when all economic indicators should have been encouraging restraint."

He saw the fleet, deprived of traditional waters, off North America and Africa and waiting — in Las Palmas, Vigo and other ports — to come for its share of the bounty inside the EEC 200-mile limits.

The effect on the fishing industries of existing member states would be disastrous, he told us. Call it scaremongering or a paranoid condition resulting from years of waiting for the EEC to fix a proper policy on fisheries, this fear is now chronic through most of the British industry.

Fortunately, it has not stopped the boats and ships that can still find fish from setting a few new high earnings records.

As usual Lowestoft was first in with a 1977 result. This is a North Sea port, strong for protection of valuable resources but not hit by the loss of distant water grounds.

Its top trawler last year was the *Suffolk Chieftain*, which spent 284 days at sea. She brought back a total of just under 600 tons and earned £259,000. This was a record for the port — £18,000 up on the top-earning ship in 1976.

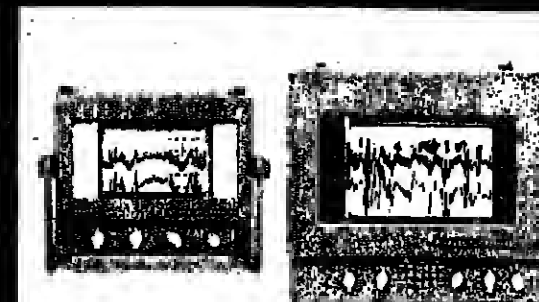
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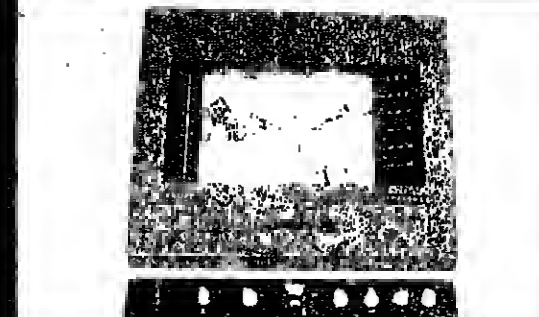


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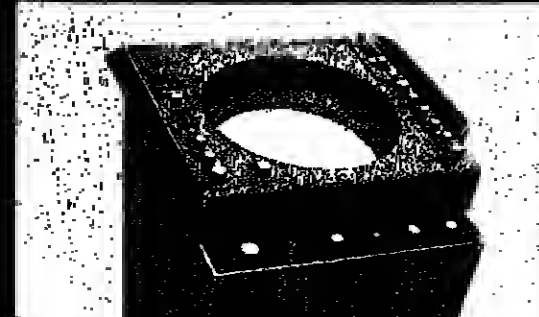


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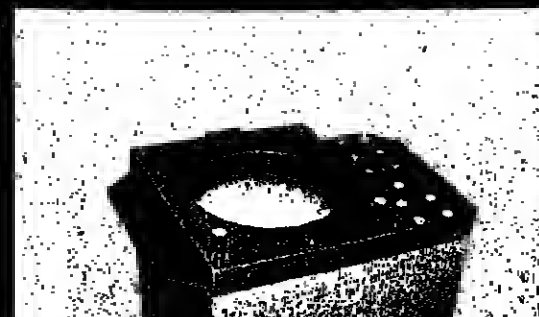
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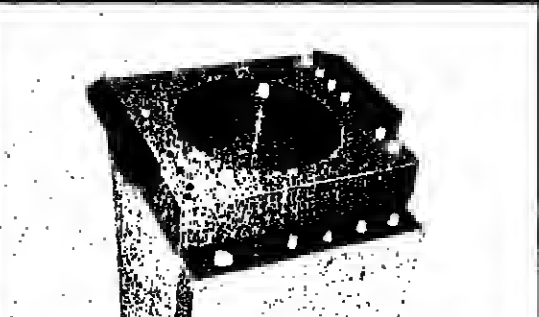
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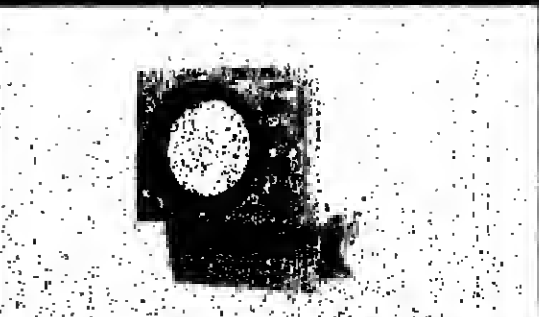


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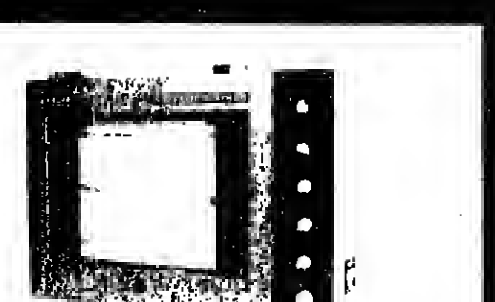


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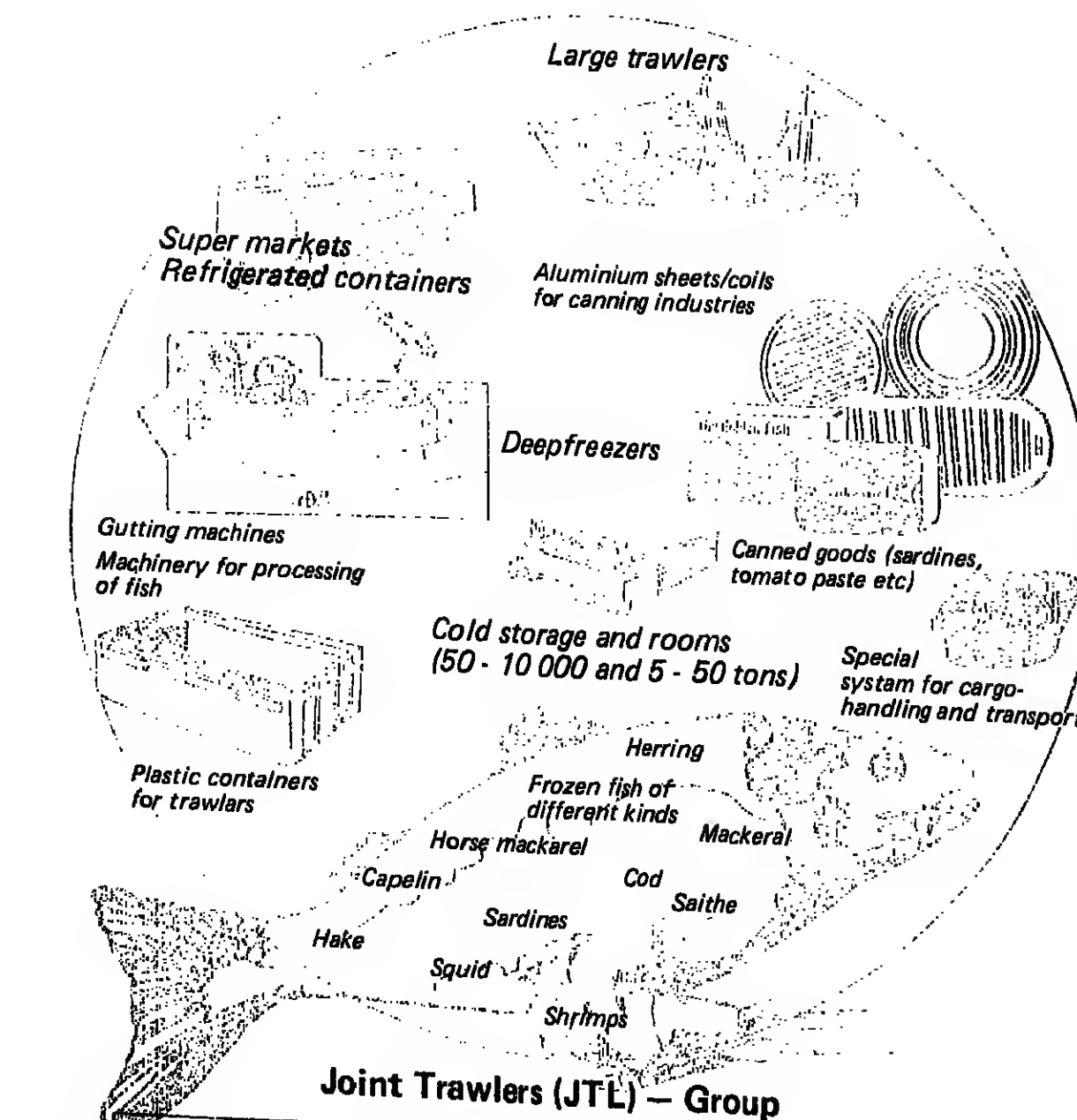




Barry Fisher and Nash Favaloro, US Pacific coast skippers, examine a model net at the White Fish Authority test tank in Hull, England. In the centre is WFA fisheries instructor David Willemen.

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TWO AMERICAN Pacific coast skipper owners flew 6,000 miles to England last month to take part in a one-week training course in gear technology. And they found it well worth the journey. The course was one of a number given at White Fish Authority's training centre in Hull. The Americans, who joined a group of British fishermen, were Nash Favaloro of Pacific Grove in California and Barry Fisher of Newport in Oregon.

They made the trip after first reading about the course in *FNI* and then meeting WFA staff at last year's fishery exhibitions in Halifax and Seattle. Fifty-four year old Nash Favaloro, who has been fishing since he was 13, operates two boats: the 58 ft. (17.7 metre), 335 hp *New Miss Inez*, which he skips himself, and the 45 ft. (13.7 m), 165 hp *Miss Inez*, commanded by his younger brother. "As there is not too much fish in the shallow water around our coast," said Captain Favaloro, "I work mainly in deep water bottom dragging for sole."

## Well worth it

"I first heard about the WFA course at Fish Expo in Seattle last year and decided to make the trip. It has been well worth the time and the money. I have learnt a lot by actually seeing what goes on under the water instead of just guessing. "We have been guessing in the right direction, but not 100 per cent, as the WFA flume tank has shown only too well. The course has given me a lot of ideas for modifying my own trawl, and I would love to come back again and bring a model of my own gear, a 400 Eastern sole net, to try in the tank."

"My brother-in-law, Martin Fornick, president of Golden Nugget Seafoods at Morro Bay, will be doing the course in April. He will also be bringing his wife who hopes to do the WFA course in business management."

Forty-nine year old Barry Fisher, who graduated from Harvard University in 1957 and obtained a Master's Degree in 1960, has been fishing since he was 14.

"My present vessel, delivered last May, is a 60 ft. (18.3 m) steel stern ramper called *Excalibur*," he said. "I am having another built now — an 86 ft. (26.2 m) steel stern

by  
**TOM WRAY**

ramper due for completion in June this year. "It is somewhat radical — twin screws, twin Kort nozzles with engines aft in the stern. Then there is another one contracted behind that, due for completion in February 1979."

Captain Fisher first read about the WFA's fishing gear technology course in *FNI*. Then, in Halifax, Nova Scotia, last year he met WFA staff who told him more about it.

"This has been an incredible week for me," he said. "It probably sounds foolish but I think I have learnt more here in five days than in 20 years at sea."

"It has not only given me plenty of ideas for improving my own trawl, but it has also taught me that some of the things we have been doing have been incorrect."

Asked what he would tell his colleagues about the course when he gets back to the United States, he said: "I will heartily recommend it as probably the best investment they could make. Rather than spend two or three thousand dollars for a new net they would be a lot better off to come over here and take this course. It is excellent value for money."

## Astounding

"One thing that astounds me about the WFA is how they are able to do so much good work on such a limited budget. Our Federal Fisheries Service has a budget of approximately \$46 million. We never see them in the ports and we get nothing from them. They are all things to all men."

# Fisheries training..

## DIPLOMA SCHEME IN SOUTHERN SUDAN

WORKING in collaboration with the Danish aid organisation, Danida, FAO is involved in a fishery project in remote southern Sudan.

This is based on fish in the River Nile and its tributaries, the Sobat and Bahr El Ghazal.

The FAO/Danida collaboration involves US\$727,000 for setting up a regional fisheries training centre in Malakal. An interim project for a fishery training institute is being sponsored jointly by the regional

government and the UN Development Programme.

This initial scheme is intended to operate until the Malakal centre is

functional. It will provide training at all levels up to higher technical standard.

The interim programme will be run for a year by two international experts. It includes training in the use of modern gear adapted to local requirements and conditions.

Trainees will also be given instruction in boatbuilding. After three years within the larger scheme, graduates will receive a diploma and are expected to become extension officers spreading what they have learnt among fishermen in the region.

In addition to the Malakal centre, Danida is backing two small industry projects at Shannbe and in the Allab area.

The fishery industry in the region dates back to the early 1950s.

## The 'Mafunzo' sails in

A COMBINED research and training vessel has been delivered by Trindervet A/S of Himmelvik in the Norwegian development aid organisation, Norad.

The vessel has been named *Mafunzo* which means "training" in Swahili. She will be used by Norad in a fisheries project in Tanzania, the development of a modern fishing centre at Mbegania about 60 km north of Dar es Salaam.

Flying the Tanzanian flag, the *Mafunzo* sailed from Himmelvik for East Africa under Norwegian officers with a Tanzanian crew.

Built in Det norske Veritas Class 1A1 stern trawler, the *Mafunzo* is 22 metres long overall with a moulded breadth of 6.5 m. and depth of 3.45 m.

She has accommodation for five crew and 12 trainees.



British and American skippers during a WFA flume tank demonstration.

One interesting development on the west coast of the United States has been the recent introduction of the new high-lift, four-panel bottom trawl designed by the Marine Laboratory in Aberdeen.

## In the States

This trawl, which is being used successfully by an increasing number of UK commercial vessels, is also achieving some success in the States, thanks largely to the efforts of Barry Fisher.

"When I met John Foster of the Marine Laboratory in Halifax last year, told me about it," he said. "We studied the technical bulletin, and although we liked the general concept, there were some things we wanted to change so we built a modified version."

"We saw no reason to mix the mesh sizes as the plans called for so we made all the webbing in the trawl of five-inch mesh."

"Secondly, we did not like the mixed tapers so we changed the tapering of the sections."

"We achieved the same mesh counts of the tops and bottoms of the various panels, but we made the tapers constant. The third thing we did was to change the tapering of the wedges to try and get more lift on the headline and more crown in the bottom bellies."

"So far we have carried out 37 sets with the Marine Laboratory trawl, and catch rates have averaged 6,000 lb of fish per trawl hour. Our Atlantic Western trawl

was averaging 2,500-3,000 lb per trawl hour so we have roughly doubled the catch rate. Also, hangups have been cut from 50 per cent to as low as 10 per cent of the sets."

"Few American boats use bobbin trawls at present, simply because there is still so much sole and you can fish away for ever on good bottom and do very little damage to your gear," he added.

"Of the boats that are using bobbin gear in my area, three have ordered the modified version of the Marine Laboratory trawl, and there are six or seven skippers in Seattle who have ordered the trawl. They are being made in Seattle."

## Sole catch

"We currently operate in an area of up to 100 miles north and south of Newport and up to 30 or 40 miles out to sea where the continental shelf ends. Before using the Marine Laboratory trawl, roughly 75 per cent of my annual landings consisted of sole. Now, I would estimate that the percentage of sole has dropped to about 40 per cent, the other 60 per cent being made up of white fish — snappers and cod."

"The Marine Lab. trawl has definitely proven its main point, that it is a much better hard bottom trawl than anything we have used so far."

Commenting on future courses, WFA Training Manager Duncan Amos said: "There has been such a heavy demand for the gear courses that we are now fully booked up until June 1978, and we

## Tonga goes for skipjack and snapper

TONGA is to develop fisheries for under reef or deepwater snapper and surface schooling tunas, particularly the skipjack. Exploratory fishing by a two-boat FAO UNDP Marine Resources Survey has shown that the best grounds for snapper are between 20 and 80 fathoms.

Altogether 27 species of bottom fish have been identified in the catches. The predominant one is *Lethrinus lentjan*, known as Manga in Tongan.

Potential yield from the fishery may be around 2,000 tons a year. This could well satisfy local demand for fresh fish.

The new UNDP project to develop the fisheries will include training in boatbuilding. Two 40-50 ft. multi-purpose boats are to be constructed locally.

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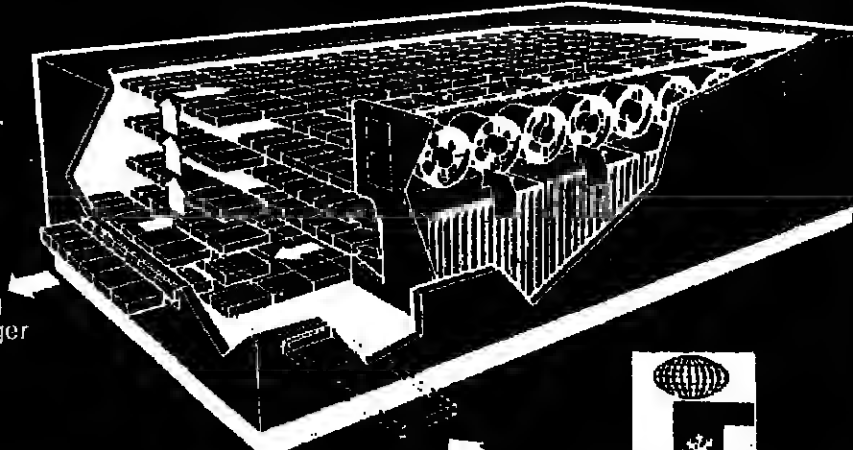
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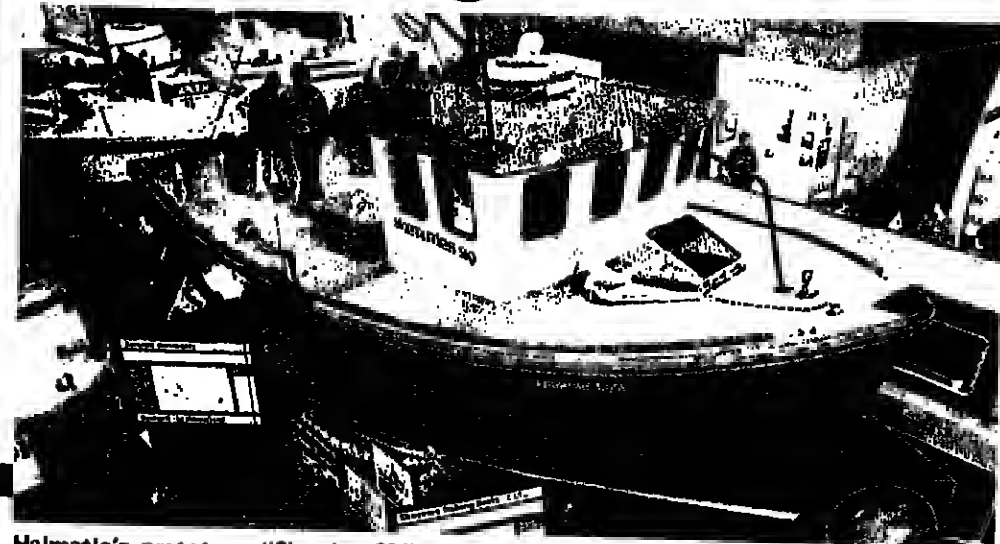
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As always, this year's LONDON BOAT SHOW was a Mecca for the pleasure market. But there were also...

# Fishing boats among the chrome and glitter



Halmatic's prototype "Skerries 29." This rugged GRP inshore boat should do much to establish Halmatic after its recent reorganisation. Pictures: Harle Knott

THE London International Boat Show in January was, as usual, primarily for pleasure boats. But there was plenty to attract the commercial fisherman, too. Obviously, many of the engines and equipment on show are common to both work and play, but fishing boats themselves were also shown.

The two main rivals in Britain's GRP fishing boat business, Cygnus Marine and Halmatic (Scotland) were exhibiting. Cygnus brought along their well-tried GM 32 which was sold on the first day.

Halmatic were showing their new well hull, rugged Skerries 29, a boat that should do much to establish this reorganised firm.

Apart from the hull, extensive use has been made of GRP in the wheelhouse and internal fixtures.

The boat on show was the first Halmatic to have completed entirely at their yard, and the standard of workmanship was good.

Cygnus are including more GRP in their boats. They were exhibiting a GRP wheelhouse, available separately or which can be incorporated in their completed craft. This could appeal to a fisherman modernising a vessel or building his own boat.

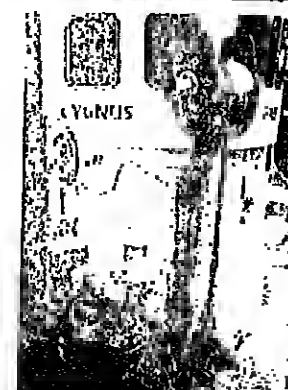
On the Robert Ives stand was an example of the Freewall 35 foot hull. This is being used increasingly for fishing boat building.

An order has just been received for three of these hulls fitted out as potter-stern trawlers for use in Tanzania. They are part of a pilot scheme to establish a fishery at Dar-es-Salaam.

A newcomer to the fishing boat market is George Butler who has tied up with the Halmatic parent company to produce the GB 40 hull.

This powerful looking GRP hull is capable of speeds up to 12 knots. Its 14 ft. beam offers ample space in the stern trawler version. Enquiries

by  
**Dag Pike**



Spencer Carter hydraulic hauler backed by the Cygnus GRP wheelhouse.

have been received from France for this design. Good news for Gardner engine fans is the re-introduction of the four-cylinder 4LW which produces 62 hp. Combined with a MG 506 Twin Disc gearbox, this unit will appeal to the single-handed fisherman. The first of these units are being sent to Denmark for fishing boats.

**Up the scale**

Moving up the scale, Sabre Marine introduced a 400 hp engine. The compact V-10 engine is a development of the M.A.N. diesel.

Spencer Carter Hydraulics attracted much attention. This well-made equipment is finding increasing favour.

A surprising number of fishermen attend the Boat Show each year. It offers an opportunity to see some of the latest in equipment. Much of the gear used in small fishing boats these days is first developed for yachtsmen, and the variety increases every year.

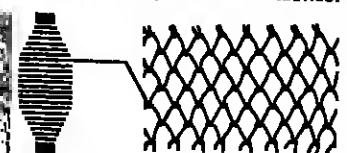


Cygnus Marine's GM32. This hull was sold on the first day of the show.

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WEATHER ROUTING is becoming an accepted aspect of merchant ship operation, reports Robin Burton. Already, about a third of the world's shipping is using routing organisations situated in Britain, Holland, the USSR and the United States. So far commercial fishing craft have not adopted this aid on a large scale. But there are signs that more custom will be attracted as forecasting techniques become more sophisticated, and more reliable.

In Britain, the Meteorological Office provides a service utilised by a relatively small number of ships in the worst winter weather. However, it uses information derived from the same sources as the largest operator in the business, Ocean Routes Inc. of California.

Ocean Routes has a wide coverage. It deals with all areas of importance such as the Indian Ocean, Pacific and North Atlantic, and it can also cover in detail specific areas not normally used by merchant ships.

One example is the information supplied to the oil industry in the North Sea from Aberdeen. This includes projections for pitch, roll and heave for periods up to 10 hours ahead.

More owners are turning to routing services as their vessels roam through wild seas in search of fish.

### Biggest advantage

The Tokyo office has a large stake in the fishing industry, supplying weather projections to the widely-dispersed Japanese distant water fleets.

Of special significance to the fishing industry is the provision of sea surface temperature analyses every five days, as certain types of fishing are related to ocean thermoclines. But the biggest single advantage of using weather projections will prob-

ably be avoidance of adverse weather.

The service should become more and more attractive to deeper operators forced out of traditional fishing grounds to roam in unfamiliar waters.

Weather routing is not intended to replace the

traditional skills and weather lore of masters. It is a purely advisory service produced with the assistance of and for the benefit of vessels sailing through and working in certain high risk areas.

Ships using routing facilities report back at regular intervals, thus aiding further forecasts to be made of use to themselves and other vessels.

Ocean Routes Inc. is by far the biggest operator in the business. It has 50 full-time meteorologists working round the clock seven days a week to route about 1,000 ships on transoceanic voyages a month.

### Global data

Ocean Routes, like its competitors, has computer access to the World Meteorological Organisation worldwide data acquisition network, which provides global data as reported by weather stations and ships.

The company also has

access to the US Navy Fleet Numerical Weather Centre (F-NWC) in California, which enables forecasts to be checked.

### Satellite pictures

Satellite photographs are also now playing an increasingly important part in assisting the production of correct forecasts.

The information supplied is detailed for the first three days, but longer range forecasts are based on an analogue system.

It sounds more complicated than it is, for in essence a computer looks back over many years of weather history to find a similar weather pattern, the results of which are known.

This information combined with climatology, allows a reasonably accurate forecast to be made for the first two weeks. Longer periods are calculated on climatological data.

# A GUIDE ROUND THE WEATHER

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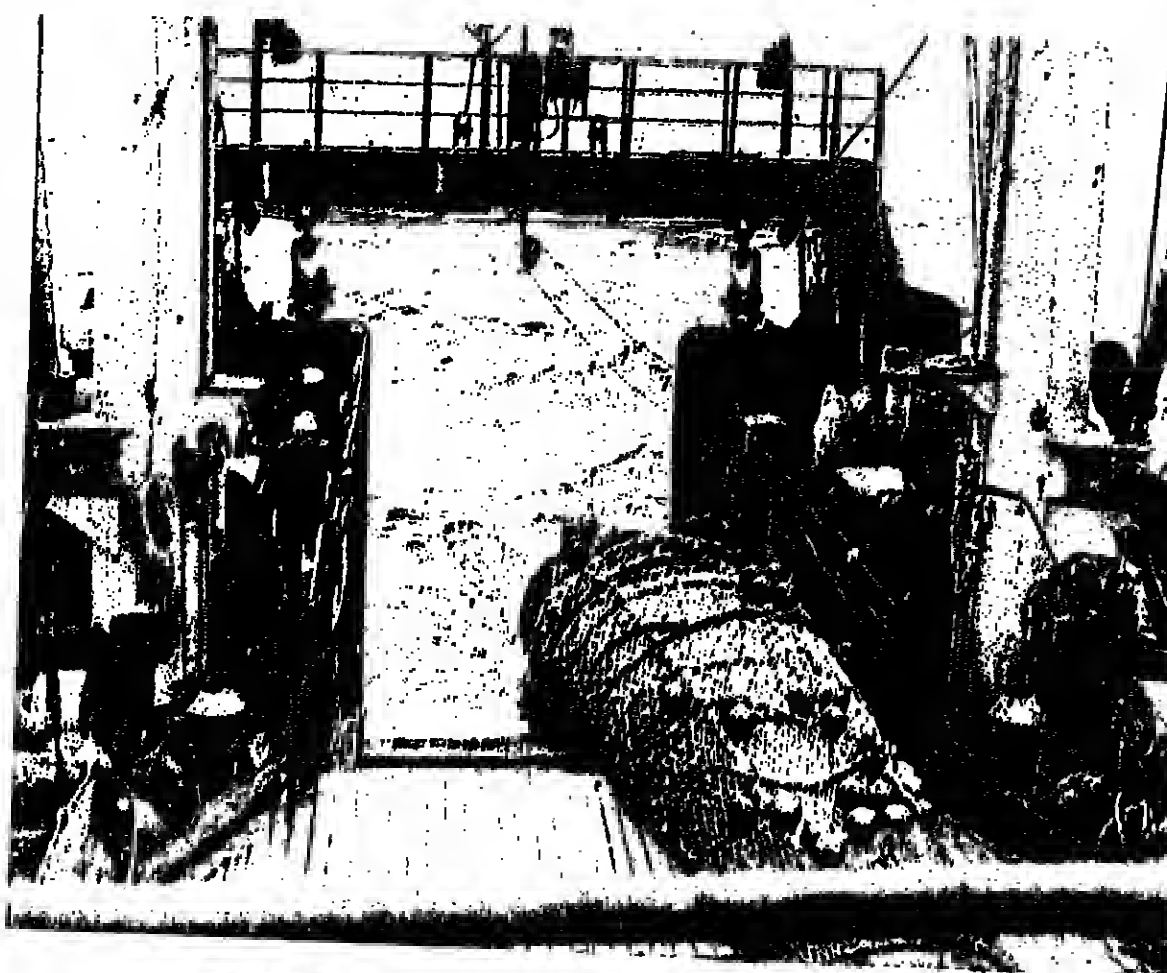
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Another blue whiting haul comes aboard 'Neptun'

## Prototype machine tested in Polish factory trawler

# NOW NORWAY DEVELOPS PROCESS FOR BLUE WHITING

SEA TESTS in a Polish trawler working to the west and north of Ireland indicate that a machine from Norway may help to boost the food use of blue whiting. The machine has been developed by the firm Trio Engineering in close co-operation with the processing section of the Fisheries Directorate in Norway. It will be marketed by Trio Maskinindustri A/S of Stavanger.

"It is a dressing machine," Mr. A. Stange Nygaard told *FNI* last month. "It prepares the fish for mincing and makes an extremely high yield possible." Trio has built two prototypes. The first handles gutted, headed codling, haddock, whiting and similar fish from approximately 0.3 to 2 kilos round weight.

The second machine is the one of particular interest to the blue whiting projects (and possibly to projects in the southern hemisphere to develop the similar poutassou). It handles smaller whole fish, especially blue whiting, from 22 to 40 cm long.

In the first machine, the operating sequence is as follows: 1. The belly is cut further open. 2. The lower tail is split open. 3. Fish scales are removed. 4. Swim air bladder, kidneys, and fish skin are removed. 5. The fish is split into two halves ready for visual inspection before mincing.

Depending on the size of fish and the skill of the operator, capacity of the machine is around 35-40 fish a minute. Yield from gutted fish is 65 to 70 per cent.

### Fish cakes

This machine is now working in a Norwegian cannery where fish cakes are being prepared from minced fish meat.

Well aware of the efforts being made by Britain, Norway, Denmark and several other countries to utilise the estimated huge stocks of blue whiting to the north-east Atlantic, Trio has concentrated on this species for its second prototype. But experience to the fishery may well prove useful for applications to other smaller food fish for mincing.

The machine beads the fish, opens the belly and splits open the lower part of the tail. Intestines, swim bladder, kidneys, and black belly skin are removed; the fish is then split into two halves as butterfly or block fillets.

Worked by two to three

## An FNI special report

operators, the machine has a maximum capacity of 150 fish a minute. But Trio estimates that a practical target under normal running conditions with an even supply and experienced operators would be 120 to 130 a minute. It intended that dressed fish from the machine should be inspected before being fed into a separator (mincer).

### Approval

After full-scale production trials by different processors in Stavanger and in Egersund, the prototype was approved for speed and yield. Mince prepared from the fish it had dressed was acceptable as raw material for fish balls, puddings and cakes.

The next step was to get the machine to sea. In early 1977, therefore Trio began working with the Dalmor Deepsee



A WFA picture of blue whiting. The fish is only 20 to 35cm. long and weighs 200 grams. The resource is more than a million tons a year.

Fishing Enterprise in Poland, through a contract with Navimor in Gdansk. The prototype machine was installed in the factory stern trawler *Neptun* in mid-March 1977.

Reporting on the trials, Engineer E. Pindelski of Dalmor said that the best results were obtained with fish over 30 cm long which made up 50 to 70 per cent. of the catches.

The machine was worked by four men. Three placed the blue whiting on the feed conveyor belt; a fourth man at the outlet end inspected the halves as he fed them into the mincer. But Engineer Pindelski feels eventual working could be with two to three operators.

### Four men

In full-scale production in the *Neptun*, the machine worked for 1,300 hours at an average speed of 135 fish a minute. This corresponded to 1,000 kilos an hour of round fish 28 to 32 cm long. With fish of 36 to 40 cm, the volume intake rose 10 to 15 per cent.

Average yield from whole round fish after mincing was 44.6 to 45.8 per cent.

"Before we installed the Trio dressing machine," said Engineer Pindelski, "blue whiting was processed into fillets before mincing, and this method gave an average yield of only 31.5 per cent. minced fish meat."

He added that the ship's engineers had no problem maintaining the machine, and could themselves make normal parts aboard.

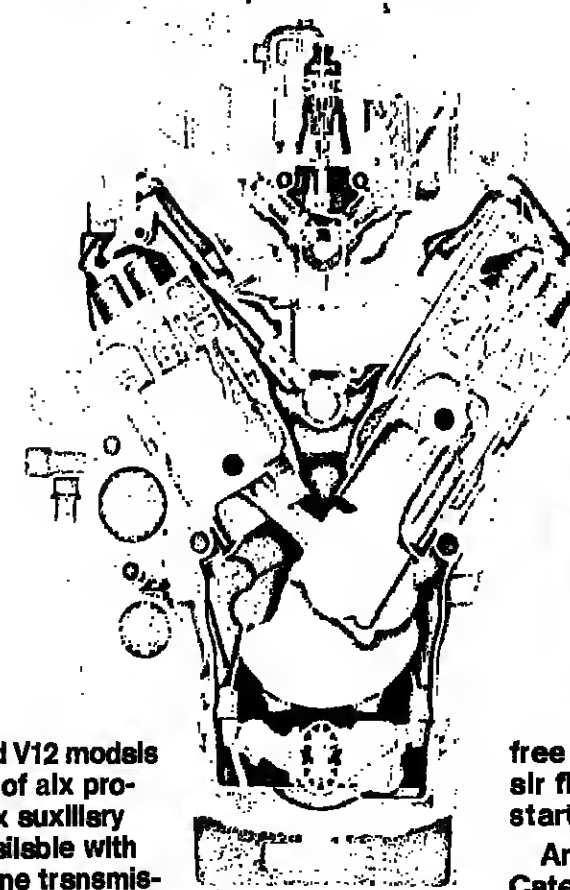
### Safe to work

"Advantages of the machine," he continued, "are simple construction, simple to operate, easy to maintain, adjustable speed, safe to work, high output and few operators. My conclusion therefore is that the machine has come through its tests satisfactorily."

He has recommended that Polish vessels handling blue whiting or similar species should each install at least two Trio dressing machines.

Trio engineers also feel that minced blue whiting meat offers opportunities for further mechanisation of processing at sea. They point out that it is a homogeneous mass, which can be easily transported by pumps. It can also be formed by machines into cakes, fish sticks or fingers, hamburgers or sausages.

"While we do not believe that minced fish can ever replace ordinary fish fillets," said Mr. Nygaard, "it does offer many interesting new possibilities for developing underused species into valuable protein food."



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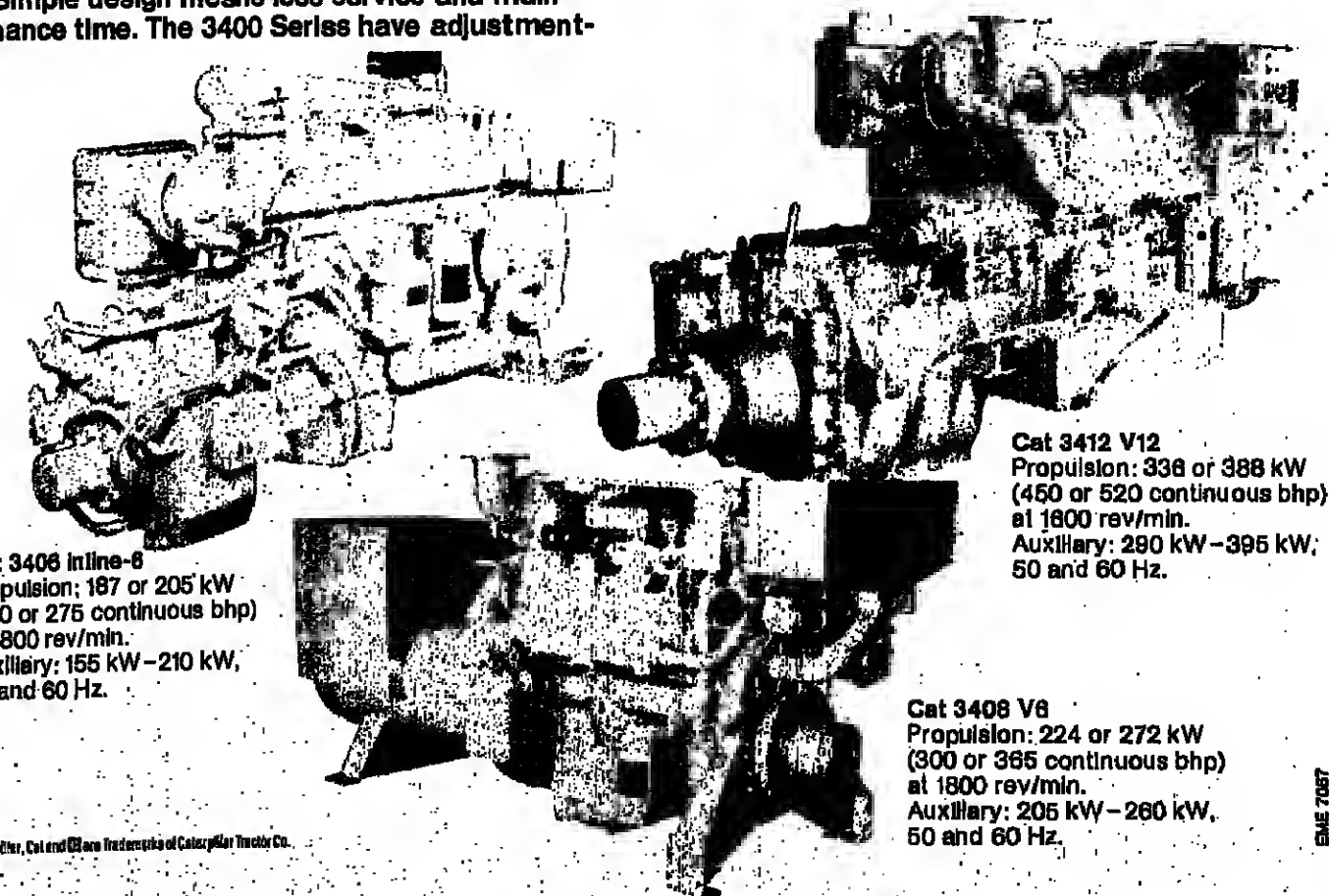
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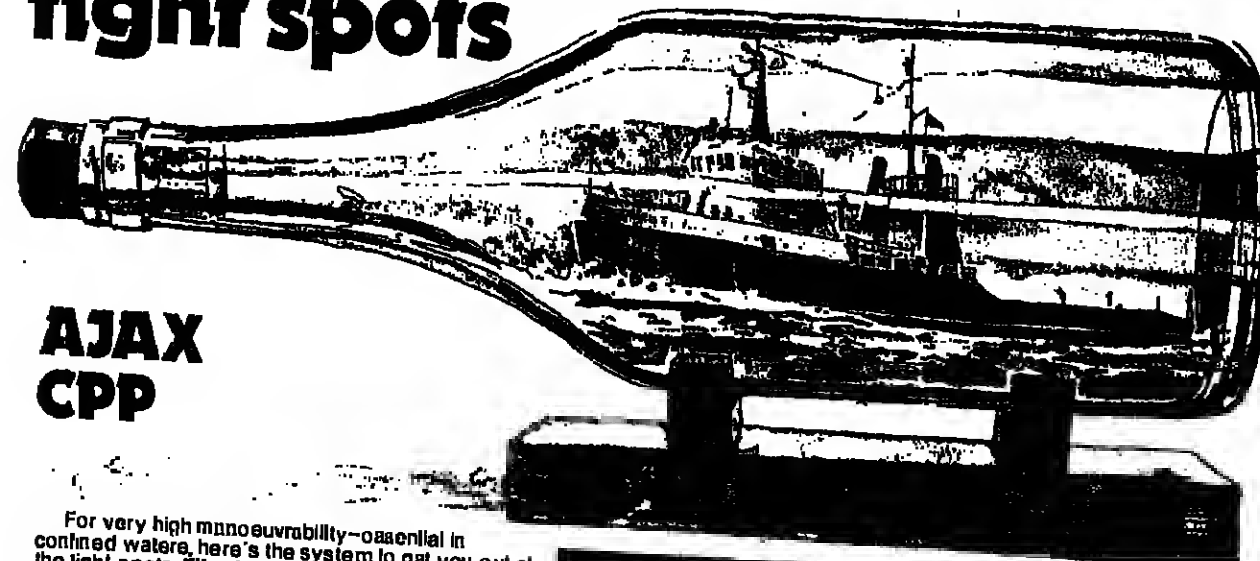
Cat 3412 V12  
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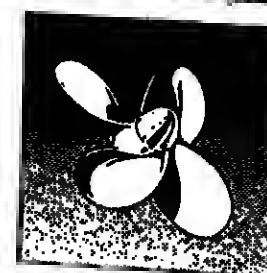
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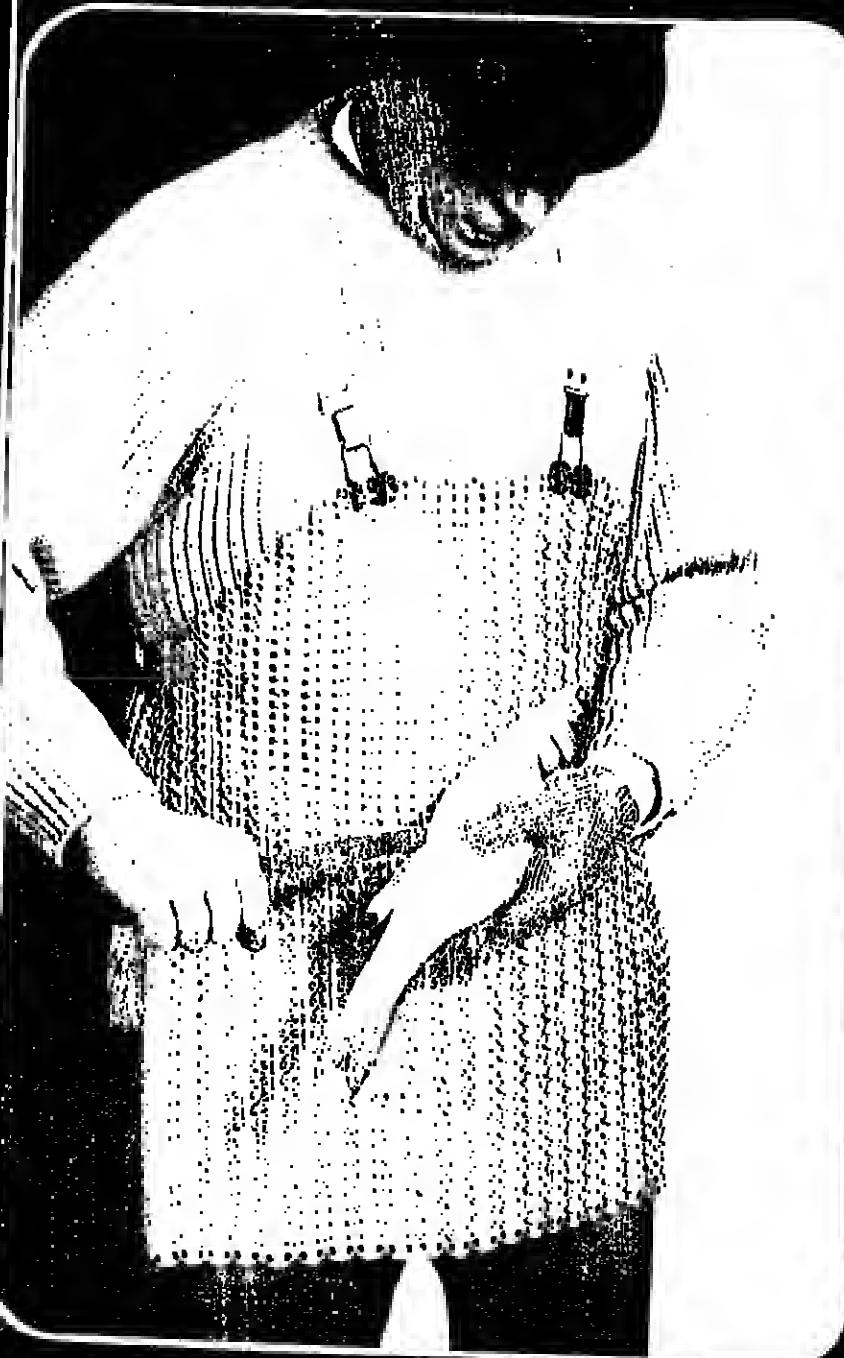
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## STOCK CONTROL BY LICENSING

### The books page

LICENSING is a word which comes up more and more as fishing countries grapple with the huge problem of managing resources, and at the same time try to achieve a fair catch distribution. This is perhaps the idealistic view. The cynic would say, with some justification, that each country and catcher is out for the biggest possible share, and that this usually adds up to far more than any stock can provide.

Few, however, would disagree with economist Neil McKellar, of the White Fish Authority, that "failure to distinguish between production of wealth from fisheries and its subsequent distribution has (often) inhibited the adoption of appropriate management measures."

He notes this in the introduction to his study of Restrictive Licensing as a Fisheries Management Tool, published by the UK White Fish Authority.

The study is not intended as a comprehensive examination of a very complicated subject but it does give enough examples, and covers enough countries, to be a useful introduction.

Looking first at schemes in Europe, McKellar points out that licensing can be used as a means of sharing the resource

itself or the benefits from the resource. There are variations, but it does seem that shared access is the only one that will satisfy an established, active fishing community.

There are, on the other hand, numerous cases where a country with fish wealth but only a small industry may develop this industry by charging for the right to fish its stocks, and also insisting on technical and other aid.

McKellar has, therefore, ranged far beyond the European experience. He outlines systems in Australia, Canada, Japan, the United States and South Africa. He then reviews what he has outlined and reaches some general conclusions. He qualifies these with the observation that

uncertainties over the objectives of management restrict a paper of this kind to informing about the extent to which restrictive licensing is now being implemented, the differences between programmes.

But he does recognise that restrictive licensing will have to be introduced to UK fisheries. He feels also that the need for rational management of the west coast mackerel fishery might have encouraged experiments with "this new management tool."

Even earlier the experience of the Canadian and US limited entry programmes could have been drawn on to arrange effective management of the Clyde herring fishery.

There, hunts under the auspices of the Producer Organisations were restricted to fishing two nights a week, "a clear case of avoidable misuse of resources."

\*FRU Occasional Papers Series No. 6. White Fish Authority, 10 Young St., Edinburgh EH2 4JQ, Scotland.

### MORE IN SERIES

OTHER RECENT papers in this excellent series by the WFA Fisheries Economics Research Unit include a Cod Profile (No. 2), The Technological Economics of Fishing (3), two on employment in the British fishing industry and the herring industry, and one of Price-Supply Relationships for Demersal Fish in the UK 1956-75.

For news of the most recent paper, dealing with fisheries of the EEC, see Pages 12 and 13.

## Cod grounds, meal odours and chilled seawater — Three new advice notes from Torry

● **THREE IMPORTANT** aspects of fish handling and processing are covered in the latest batch of Advisory Notes issued by the British government's Torry Research Station in Aberdeen, Scotland.

In Advisory Note No. 71, R. M. Love briefly reviews work he has done in recent years on the influence on cod for processing of the time of the year it was caught and the grounds from where it was taken.

Buyers, he says, can often tell where a cod has been caught by its shape, colour or smell. When there is a choice, they may prefer fish from certain grounds at a particular time of the year. It is also common knowledge that cod does not keep so well in ice at certain seasons, or it does not yield as satisfactory a frozen or smoked product. His Note summarises what is known about the effects of ground and season.

● **Reducing odour** in the production of fish meal is the subject of Advisory Note No. 72. It considers handling and storage of fish and offal, process control, handling and storage of the meal, and design and maintenance of equipment. While it is not yet possible to prevent offensive odours completely, they can be substantially reduced.

Torry points out that much of the advice is already being followed but some of it applies in particular to the design of new buildings and equipment.

The advice given, Torry explains, is also intended to serve as a basis for discussion between local authorities and industry when

factories are modified or when new installations are being planned.

● In *Advisory Note No. 73*, J. H. Kelman considers a subject of growing interest to vessel owners around the world seeking higher prices for good quality food fish — *stowage of catches in chilled seawater*. After first outlining the advantages of chilled sea water over storage in ice, the Note examines and illustrates the fixed and portable tank systems.

On the question of which to choose, the Note points out that, where there is a long journey from quayside to factory or market, fish in portable tanks stay undisturbed and so are likely to arrive in better condition. But fixed tanks make better use of stowage space; a purse seiner can hold at least three times as much fish in fixed as in portable tanks.

Removal of portable tanks from a properly fitted ship and replacement with empty tanks can be a quicker, cheaper and easier operation than unloading the same amount from fixed tanks and then lashing it in boxes on a lorry. But at least three sets of portable tanks are needed to operate a single ship continuously.

These and other observations in this Note should make it useful well beyond Britain, among owners and handlers of food fish in many parts of the world.

Information about Torry Advisory Notes can be obtained from The Director, Torry Research Station, PO Box 31, 135 Abbey Rd., Aberdeen AB9 8DG, Scotland.

THE CHEERY "walkabouts" of the Queen and Prince Charles, now so popular, have brought to light this quip with which the Prince set at ease the interviewer who sought him at Buckingham Palace. As he shook hands the Prince said, "I trust you had no difficulty in finding the place!"

From a factual reading of the press I gather that a strange type of man is now being recruited into the fishing industry — he is the "less and less" man.

What a "less man" is, I don't know. Reference to the dictionary tells me that "less" means "devoid of" or "without" or "small"; what the "less man" is devoid of I would like to know — whether it is mere size or the usual number of limbs.

I know what topless means, or headless or brainless. I have even heard of a manless community — this to the great concern of the ladies therein. On reflection and much cogitation I conclude that what is meant is that "few" or "fewer" men are now entering the fishing industry.

### Simple rule

The simple rule given me in my school days was that "less" was applied to quantities or "bulk" and "few, fewer and fewest" related to numbers. But perhaps I'm being fussy. Perhaps modern, sloppy usage of language is taking over, for I do notice that the use of "less" instead of "fewer" is increasing more and more. So I put it to you as a matter to "talk about."

In my youth, among other ideas for earning odd guineas, I went to the secretary of the London County Council and asked to be allowed to have a day in the sewers.

He was a kind man and, after quizzing me on the reason why, gave me two men with instructions for a most informative day.

That experience recurred when radio and press publicity recently focussed attention on the growing menace in the Mediterranean of sewage and other pollution, especially on the northern shores.

Figures given were that 400,000,000 tonnes of sewage (mostly untreated) and industrial waste were being tipped into it each year to the peril of sealife and the tourist industry.

I have deliberately put that total tonnage into figures so as to impress. Let me accentuate them further.

Suppose for some mad reason you wanted to ship that waste out into the Atlantic and sought tankers each carrying 100,000 tonnes to do the job. How many would you need? Just four million of them — silly idea, eh? But it drives home the size of the problem.

The nations concerned are facing up to it. They are having to. It is serious. Of 700 beaches, many are affected. Bathers can suffer skin rash and ear, nose, and throat infections. They can even catch cholera and typhoid — 17 deaths so far recorded by the World Health Organisation.

Apart from sewage, industrial waste contributes 100 tonnes of mercury, 500 tonnes of lead and 60,000 tonnes of detergents. The effects can be especially bad on shrimps, prawns and shell fish.

Toxicity of sea water to cope with pollution is very great. The nutrients in sewage add beneficial valuable elements to the ocean supply but mineral and chemical wastes can be toxic. So the cities and countries concerned are organising themselves to cope. Energetic steps already show beneficial results.

FAO early saw this problem developing. From the ten-day conference in Rome in December 1970 there emerged the volume *Marine Pollution and Sealife* — a magnificent work.

In its seven sections which cover all biological and technical aspects, no fewer than 207 scientists and engineers contributed 127 detailed papers dealing with local and general problems. And, stirred by the Mediterranean crisis, I've spent a few worthwhile hours mulling over some of the papers.

The pollution of nature by man is essentially modern. London, for instance has had a sewage system only since around 1880. Until then rain water swilled house and street residues into the Thames. European cities used their rivers in similar fashion.

In the article I wrote those many years back, I recorded that the sewers installed down both sides of the river carried all material into settling tanks. From them a fleet of eight barges each carried daily to the open waters a thousand ton load of sludge.

Now, from Dr. Cole's article in the Pollution book, I learn that dumping of sludge has gone on for 80 years and today exceeds five million tons annually. But Dr. Cole quotes an ICES report saying "that neither the oxygen content of the water nor the character of the bottom had been materially affected" thanks to natural conditions of tide and flow ensuring rapid movement and mixing.

The Mediterranean is not so fortunate. Tidal movements and water flow are limited — the estimated turnover of its water volume requires 82 years, in contrast to the Baltic's 21 years. So man has to hasten nature's cleansing processes. Modern methods are more and more to pipe sewage to release in deeper water well off shore.

Human waste, being organic and natural, actually adds nutrient to the sea as it does to the land. One well-known USA fishery institute uses sewage for the experimental growing of oysters — quite successfully, provided days for cleansing in clean water are allowed.

The real problems are associated with metal and chemical wastes, oil and plastics but scientific and industrial skills are being effectively concentrated on them. This remedial industry is itself becoming big business.

In spite of her wide sweeping ocean frontage, the USA is not as well served by Nature in clearance of rubbish and waste as are the front doors of Britain and Europe where more confined waters enforce stronger tidal currents and clearances.

### Dumping

Take New York and its environs! In recent years the Atlantic ocean was asked to swallow 9.6 million tons of solid waste annually and to deal with an increase of four per cent a year. That dumping represented the biggest source of sediments entering the ocean from the North American Continent.

The two main locations used in the New York Bight covered an area of 20 square miles. After consistent use for 40 years examination revealed low levels of oxygen in the water and notable lack of fauna on the bottom. The benthic communities were of low diversity and high dominance by organisms that were resistant to the stress conditions created.

Although man with his fecundity and industrial skills has himself created this problem of polluting nature, he is showing himself able to correct it, and restore the position — given time. In the American Great Lakes area great difficulties did arise

in enclosed waters. Lake Huron in particular was almost once devoid of satisfactory life but has been restored by skilled management.

The world's most tragic pollution disaster was the Minamata Bay incident of the 1950s when mercury released from a pulp mill was absorbed by fish — main diet of the inhabitants. Over a period that mercury afflicted some 10,000 people and caused the deaths of many hundreds. Health authorities today are alert in possible menaces from mercury absorption.

Several newsy letters recently from overseas conveying seasonal greetings give items of fishery interest.

Peter Pownall, who does a superb job in editing *Australian Fisheries* tells me his things are developing "down under" with the inception of the 200-mile limit.

He is likely to visit Japan in June with a delegation of fish exporters. Japan is their main outlet, and the market is expanding.

Peter headed a group of 60 fishermen to the Seattle Expo in October. They received a warm welcome at all ports visited and exchanged much fishy data.

The size of Alaska's crab industry amazed the Aussies — it alone is worth more than the present total catch of all fish round Australia.

Japan's need of fish is impressive. For tuna the Japanese housewife pays more than a pound a pound. Crabs caught on Japan's own north coast range from £5 to £10 (the equivalent) in Tokyo shops.

A letter from California tells me that US tuna fishermen are so upset by new regulations to safeguard dolphins that more and more are transferring to foreign registry.

### Huge need

Strange things still occur. In Rome once, at an FAO conference, I met a man back from a fishing project in New Guinea. It is one of the largest islands in the world with an extremely rugged mountainous interior and isolated valleys. He told me this story.

With police support he was exploring one of the main rivers when from their canoe they saw, as they rounded a bend, a native on the bank tending a fire. It being near lunch-time they pulled in, and greeted him in pidgin English (the common language).

"See what he's cooking?" asked one of the party. A little way from the fire lay a human body and from its thighs nice steaks had been cut and were being grilled. "Mo no kill him," asserted the native. "He floating down river — me pull him in. He looked fresh — why not cook him?"

That incident came back to mind when my daughter mentioned that an order had just been received from Naw Guinea for copies of Captain Howd's *Navigation Primer* to be sent out for a training school.

An agitated feminine voice from Milan asking for the immediate despatch of the book dealing with the culture of snakes was finally interpreted as wanting Dr. Usui's work on *El Culture*.

In the Po valley of Northern Italy, there lies one of the most famous eel fisheries of the world. The annual migration down stream yields big catches — so sending a book there on how to grow more eels seemed much like sending coals to Newcastle.

## walkabout talkabout

with Arthur J Heighway



Growing menace of pollution in Mediterranean ...and off the US east coast

### Joint study of gear design

WRITTEN in German, *Fischfanggeräte* (meaning fishing gear) is a joint Soviet-East German attempt to present the principles of fishing gear technology.

Basic principles of gear design are described in the first of two sections. These cover the theory of movement of gear components as a basis for complex calculations, the theory of similarity and the modelling of gear.

Other sections cover theory and design of distant water gear — including trawls, purse seines, bottom trawls, long-lines, light and electro fishing equipment and hooks.

*Fischfanggeräte* is written by Professor H. Stengel, of Wilhelm-Pieck University, Rostock, East Germany, and Professor A. I. Fridman of Kalingrad University, USSR. It is published by VEB Verlag Technik, Berlin, East Germany.

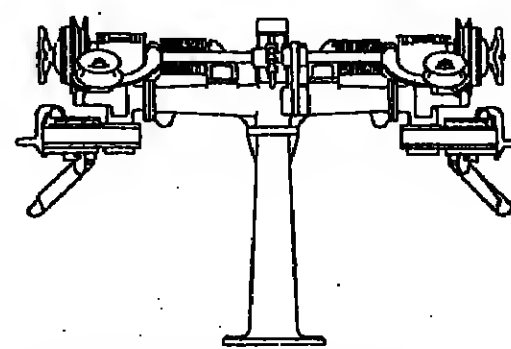
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# WINCH FOR MEDIUM PURSE SEINERS

A MARCO "Small Super Seiner" main purse winch has been ordered for each of four new-generation anchovy purse seiners being built in Chile.

This follows the successful initial application of the winch in six anchovy seiners operating off Mexico.

Marco of Seattle, USA, developed this particular winch because of recent trends in purse seining. The size of purse seiners has been gradually increasing over the past 25 years, explained Marco president, Peter G. Schmidt. Vessels ranging in length from 27 to 40 metres have emerged as the favoured craft for catching sardines, anchovy, herrings and pilehards.

## Fills the gap

Winches available for the mid-size purse seiner have been either small units of 50 to 70 hp intended for smaller boats, or a large Super Seiner winch up to 400 hp for tuna ships. The new 250 hp Small Super Seiner winch is designed to fit into the gap. And it can also be used by smaller tuna purse seiners.

Design features include brake and clutch for each of three drums, and two separate hydraulic drives, one for the main purse drum and one for the forward purse and tow line drums.

## Independent

Separate drives permit each end of the purse line to be hauled independently at differing speeds. Each drive can produce a mid-drum pull of more than 100 tons.

The Small Super Seiner has two hydraulic operating modes for versatile performance

Marco's new 250-hp, three-drum hydraulic winch, designed specifically for mid-size purse seiners and small tuna seiners

during all stages of purse seining. The winch is capable of increased hauling speeds during pursing and increased line pull required when lifting the rings.

Cable capacity of the main drum is 1,000 fathoms of 16mm (five-eighths in.) wire, and the forward purse drum and tow line drum have capacities of 500 and 235 fathoms respectively. The main purse drum is equipped with an automatic diamond-screw levelwind.

The six Mexican anchovy seiners using the winch are 33m (108ft.) long and the four vessels under construction in Chile are 31m (102ft.) long.

## GRP hull probe

THE NEW Panametric 5227 ultrasonic probe can be used to measure the thickness of a GRP hull without the need for a metal backing strip on the interior of the hull. As this does not require any access to the boat's interior, it is of considerable value to small-craft surveyors says Lloyd's Register.

In association with Teledetector Ltd., Lloyd's Register demonstrated the Panametric 5227 at the London International Boat Show last month. A cassette-type instrument, it incorporates a digital readout.

According to Mr. Maurice Jobling of Lloyd's Register, the instrument should be of great use in assessing GRP hulls during condition surveys and perhaps in cases of dispute between owners and builders.

"With its aid," he explained, "we can easily check for any suspected large air inclusions in the moulded hull or any suspected cases of major delamination."

## Three months and three engines

ON ITS STAND at the International Boat Show in London last month, the British firm E. P. Barrus Ltd. showed the third new-model Mariner outboard engine to be introduced in a period of only three months. It brings the Mariner range up to 15 engines, from two up to 140 hp.

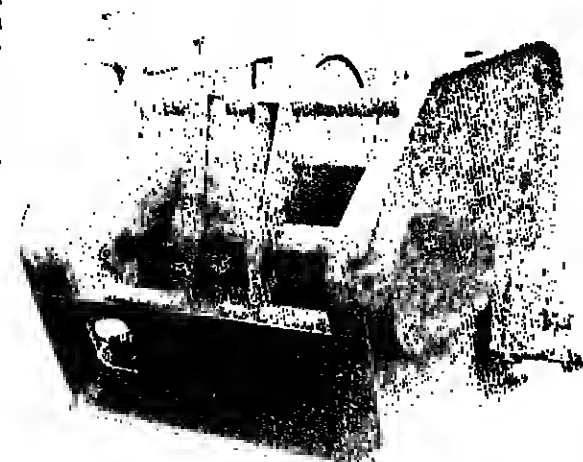
This latest engine, 140 hp six-cylinder in-line outboard was flown over from the US manufacturer for the Show, "where it created tremendous interest."

Claimed to offer com-

mercial and recreation boat users "fine performance throughout its speed range," the engine incorporates electric starting and is available with or without "power trim." It swings propellers from 11 to 25in. pitch.

## Standard

Weight of the standard model is 131 kg (290 lb). Standard features of the Mariner 140 include battery charging alternator, 22.7 litre remote fuel tank, hydraulic shock absorbers and tilt switch.



## product news

METHODS • GEAR • EQUIPMENT  
PLANT • COMPANIES

## Ten-man life raft

A TEN-MAN life raft with several new design features was shown by Avon Inflatables Ltd. at the London International Boat Show last month.

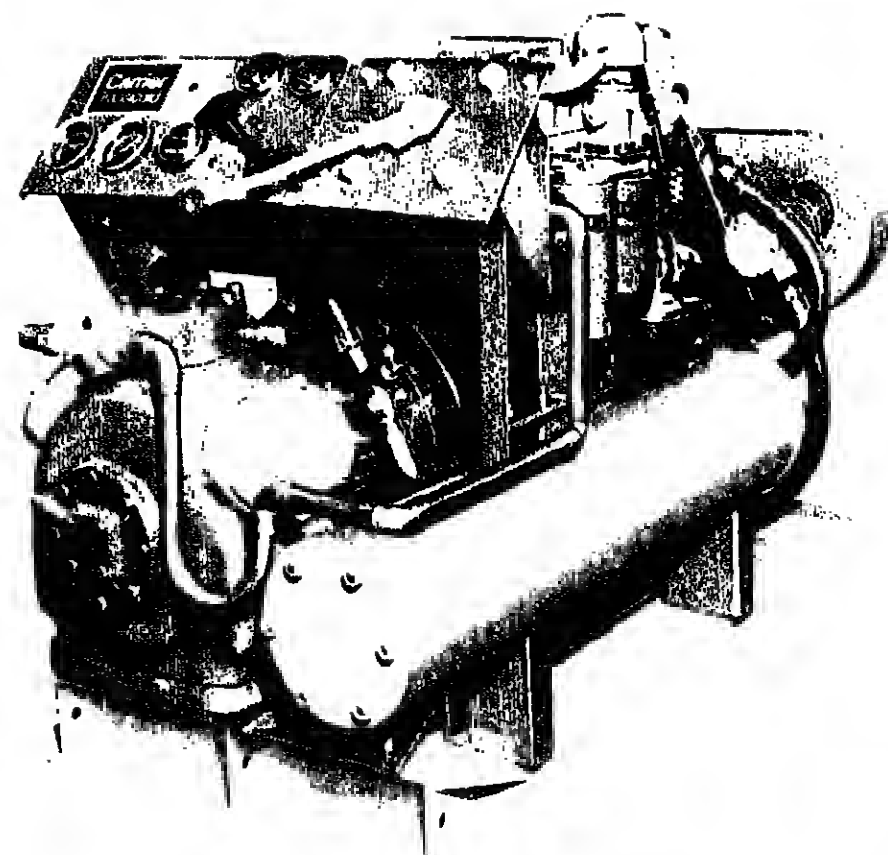
The new design includes an angular shaped arch and a flatter roof section. Double inflatable floors are offered as an optional extra.

Avon life rafts — to carry 4, 6, 8 and 10 people — are ready in 30 seconds with automatic inflation.

## New folding life-jackets

Also introduced by Avon at the Show were a new folding air and a folding carbon dioxide lifejacket. Avon already makes air, air/foam and partial CO2 lifejackets.

Designed to increase freedom of movement and reduce bulk, the new lifejackets are compact and fold on to the chest when deflated.



The new Dolphin marine refrigeration system

# Versatile new on-boat cooling system

THE AMERICAN Carrier Corporation has developed a new marine refrigeration system for deepsea fishing vessels, reports British subsidiary Carlyle Air Conditioning Co. Ltd. of London.

Called the Dolphin, this system rapidly reduces and holds temperature either in the ice bunker and/or in the fresh fish hold, or it can be used for cooling on-deck brine immersion tanks.

Temperatures in the hold areas can be held as low as -29 deg C (-20 deg F). The unit is designed to produce 5040 Kcal/h (20,000 Btu/h) at a fan coil evaporator return air temperature of -29 deg C.

For on-deck immersion tank applications, cooling can be delivered to a tank of 1,136 litres (300 galls) of brine at an

average -18 deg C (0 deg F).

The Dolphin has a Perkins 4/108 engine adapted for marine duty with starter, injectors and glow plugs located for easy servicing. The oil pan is oversized for 1,000 hour operation and engine cooling is available for either fresh or sea water. A dry-type air cleaner and spin-on oil and fuel filters are standard

equipment for speedy on-board servicing.

The unit's "undrive" alternator assembly provides electrical power for the evaporator fan motor from a permanent magnet generator without belts, brushes or pulleys.

Built-in safety features include automatic oil pressure and water temperature safety switches.

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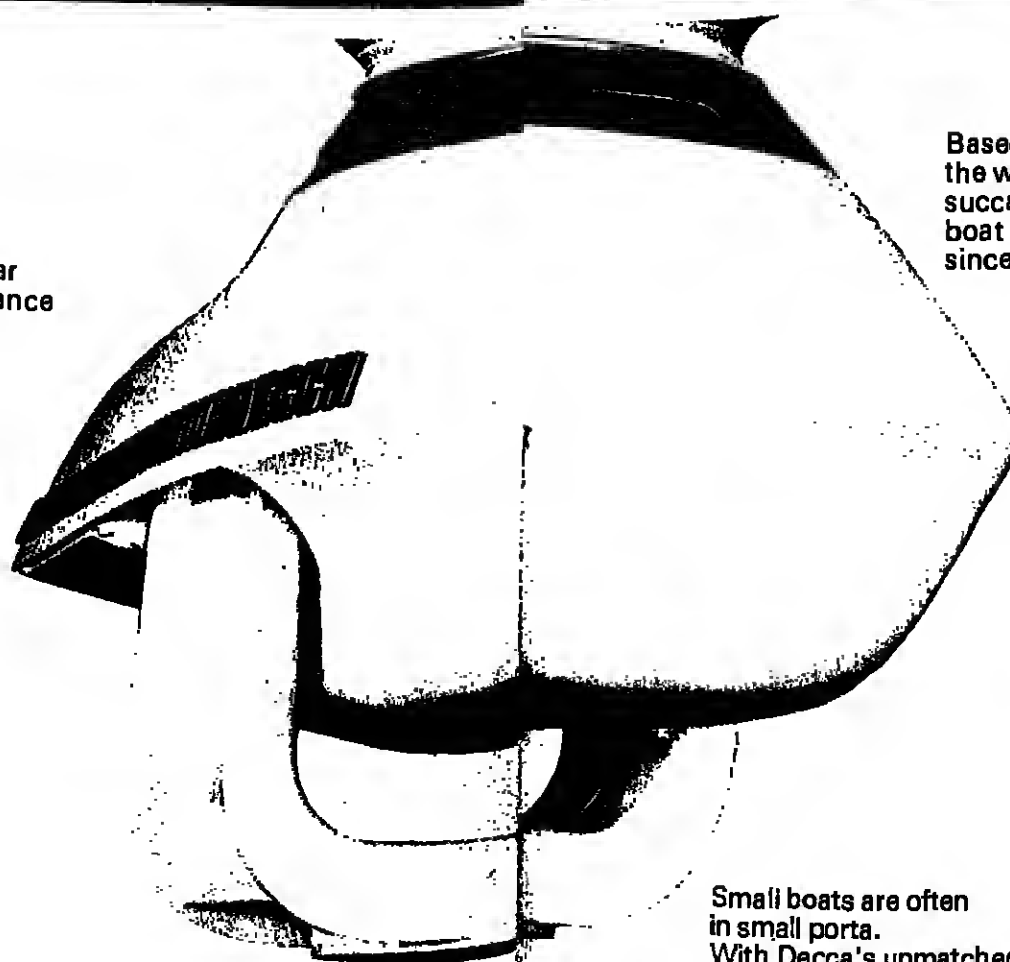
Very good visibility of small targets.

Very low compass-safe distances.

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Decca Radar Limited, Albert Embankment, London SE1. Tel: 01-735 8111.



Based on Decca 101, the world's most successful small boat radar since 1967.

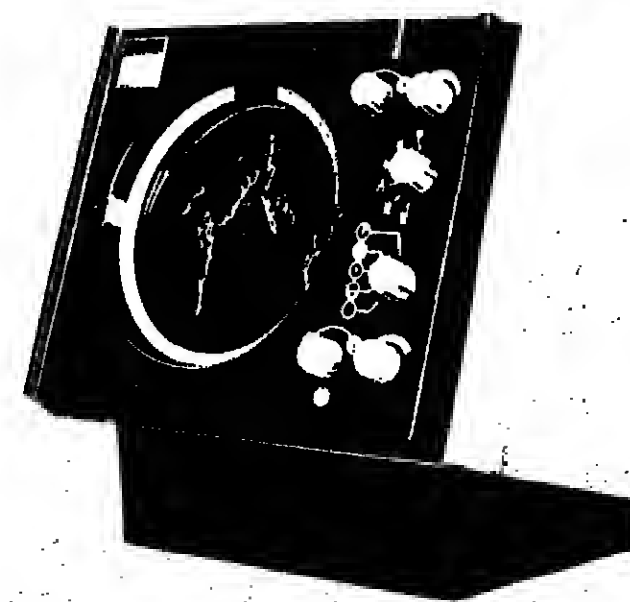
110 benefits from the Decca AGREE programme of reliability engineering, still unsurpassed.

Small boats are often in small ports. With Decca's unmatched world-wide service organization, a Decca service engineer is the one most likely to be on hand.

Decca service support helps make the 110 popular as a second radar in larger ships.

Simple design proved at sea in 14,000\* boats including the vessels of 38 navies.

Every Decca radar benefits from the large investment in quality and reliability made possible by Decca's large scale production of the world's widest range of equipment.



THE FIRM Micro Marine Inc. of Southern California has brought out a new, "competitively priced" marine HF single sideband radio telephone. Designated the Offshore 100, it has 100 watts of peak envelope power.

It offers the user 11 channels (including 2182 kHz distress and calling frequency) and operates in the 2 to 9 MHz radio transmission band. The user may select any 10 channels either simplex or half-duplex within this band.

Features of the Offshore 100 include built-in antenna coupler utilising a toroidal matching coil that greatly reduces installation tune-up time.

The radio has a heavy-duty, all-aluminium cabinet and built-in over voltage protection circuit. Modular circuit card construction permits easy card replacement should this be necessary.

"Reliability of operation has been given the highest priority in design and manufacture of the Offshore 100," says Micro Marine.

Further information from Micro Marine Inc., 2235 Micro Place, Escondido, California 92025, USA.

## DYNAMIC BRAKES HELP TRAWLING

IN THE latest of its Norwinch catalogues, BMV of Bergen includes an account of how dynamic braking improves the efficiency of its low pressure deck machinery when trawling.

## Dunlop saves 15

DUNLOP inflatable life rafts helped to save 15 lives in two incidents off the coast of England in December. One involved a 499-ton West German coaster which sank 12 miles out from Liverpool.

In the other, the trawler *St. Patrick* of Lowestoft caught fire off the Kent coast.

While eight of the crew of ten were sent away from the burning vessel in one of her two Dunlop Seafarer life rafts, the skipper and the mate remained aboard. The Dover lifeboat eventually located trawler and life raft in heavy seas and picked up the crew.

The *St. Patrick* was later towed into Dover harbour and the fire extinguished.

During shooting of the trawl nets, says BMV, the doors have to be kept in a spread position with the warps of equal length, otherwise the net will tend to spin.

"In a Norwinch installation," it continues, "the hydraulic dynamic brake system is utilised and this provides the operator with an assured, smooth warp length regulation."

The Norwinch hydraulic towing system incorporates automatic trawl warp tension compensation which continuously adjusts warp length and thus improves performance.

With mid-water (pelagic) trawls, it permits smooth control of fishing depth variation.

In both methods, bottom or mid-water, another advantage of the system is that it compensates for changes in warp tension.

\*orders to date for 110 and 101 = 15,274



# An outboard power pack



Pete Brown, sales manager for Sea-Power-Pacs, points to the pressure hose on the new OMC-70-A kit.

WITH Sea-Power-Pacs, says the Maine firm Fluid Power Services, you can "fish like an inboard on an outboard budget."

The reason is the hydraulic power package which bolts directly to the flywheel of the outboard motor. It takes power from the engine and can be used to drive gillnet haulers, gunwhale rollers, power blocks of various types, pot haulers or small winches.

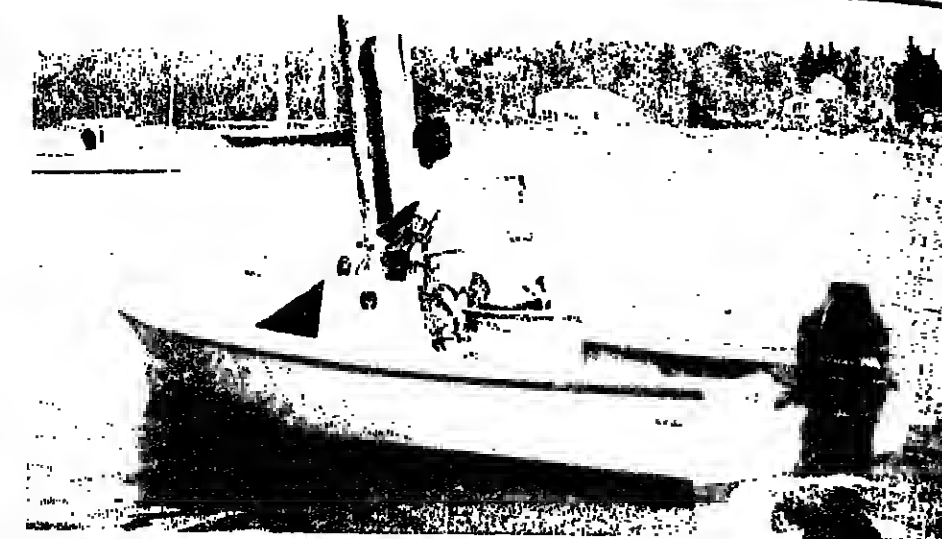
Developed by Fluid Power Services and Stetson and Pinkham Inc., a dealer in outboards, each kit is de-

signed to mount on a specific engine. The first available was the M-50-A, which mounts on the Mercury 50hp engine, and the M-115-A for the Mercury 90 and 115 hp engines. Now introduced is the OMC-70-A kit for Johnson or Evinrude 50

hp engines.

Flywheel and pump mountings are being patented by the maker. The unique mounting, says Fluid Power Services, eliminates all belts and pulleys, gears and clutches, making the system almost maintenance free.

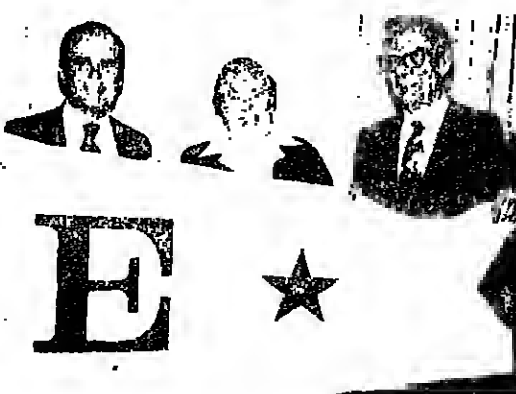
Each kit includes top cover, gaskets, mounting brackets, coupling, hydraulic reservoir, filters, control valve and a section of hose. Further information from Pete Brown, Fluid Power Services, P.O. Box 81, Warren, Maine 04864, USA.



A Mercury 500 equipped with a Sea-Power-Pac Kit No. M-50-A. Note the hydraulic pot hauler at the man's right hip. This compact unit is working on a boat scooping in the waters off Massachusetts.

## product news

METHOD  
● GEAR  
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## EXPORT AWARD

A PRESIDENT'S E-Star award for excellence in export activities was presented in January to Peter G. Schmidt (left), president of the Marine Construction & Design Company (Marco) of Seattle, Washington. The presentation was made by Dixie Lee Ruy (centre), governor of Washington state.

Marco's work in exporting machinery, vessel design and technical expertise to commercial fisheries around the world was the basis of the award by the US Department of Commerce, represented by Judson Wonderly (right), director of the Seattle Field Office.

## Marine metal protector

MOLECULAR ceramic steel is described by its British maker as "an entirely new product which affords metal surfaces complete protection against erosion-corrosion."

This is a problem wherever corrosive turbulent liquids are in contact with metal surfaces, and is thus well known to operators of steel fishing craft.

The protective substance has been developed by the Yorkshire firm, Belzona Molecular Metallite Ltd., of Harrogate. It claims that correct use of Molecular ceramic steel gives components previously unobtainable protection against both forms of attack.

It is also said to be quick and easy to use. This includes



Molecular Ceramic Steel being applied by spatula rebuilding of components already damaged by corrosion; and it resists abrasion.

The maker says that it has "outstanding adhesion even to damp surfaces."

Being an electrical insulator, Molecular ceramic steel can also be used where two dissimilar metals have to be treated.

Further information from Belzona Molecular Metallite, Claro Road, Harrogate, North Yorkshire, England.

## Marine products catalogue

WESMAR Marine Electronics of Seattle has brought out a new Marine Products Catalogue.

Photographs, features and specifications are included for Wesmar's complete line of electronic equipment for fishing boat and other applications.

The 60-page catalogue — in three languages, English, French and Spanish — includes all Wesmar's scanning sonars, chart recorders, autopilots, depth sounders and rudder angle indicators.

Copies can be obtained from Wesmar Marine Systems Division, 905 Dexter Avenue North, Box C19074, Seattle, Washington 98109, USA.

## Bulletin updated

TWIN DISC INC. has published a bulletin giving new and updated information and specifications covering the firm's line of pump-mount power take-offs. Units are available for 50 to 800 hp engines.

An integral part of any hydrostatic system, these pump-mount power take-offs feature a compact, low profile design with a variety of speed-up or reduction ratios on multiple pump units. Input options include clutches, rubber block splider, flex plate or independent shaft. The new Twin Disc Bulletin 333 is available from Twin Disc Incorporated, 1328 Racine St., Racine, WI 53403, USA, or any Twin Disc authorised distributor.

## Polyform's new MD

SALES MANAGER Einar Aasen of Polyform A/S, Alesund, was last month appointed managing director of the company.

Mr. Otto Steffensen will continue as chairman of the board and will remain active in the company, mainly in research and development work.

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# ABERDEEN'S SHOW HEADS FOR RECORD

## Meetings and exhibitions

THE organisers of the CATCH 78 fisheries exhibition in Aberdeen, Scotland, in June report many more bookings than for the first show in 1976.

They see this as evidence that there is still widespread confidence in the fishing industry, "which is likely to occupy an important place in the Scottish economy for a very long time to come."

The Aberdeen International Fisheries & Marine Equipment Exhibition, will take place from June 14 to June 18 on the Queen's Links in the Scottish port. It is organised by Eagle Exhibition Consultants Ltd.

"With two large pavilions and many outside exhibits covering a total area of 9,000

sq. metres," says Eagle, "the exhibition will be twice the size of the previous Aberdeen event in the series. And that was itself acclaimed as the largest and most successful show of its kind ever held in Scotland. Its success may be measured by the proportion of exhibitors who on this occasion have taken more space and by the number of companies who will be showing for the first time."

In addition to UK suppliers, there will be exhibitors from nine countries. The new feature this year will be national multi-company stands by Norway and Denmark. Another feature will be the number and variety of engines on show. No less than 26 engine makers are taking part, providing, says Eagle, "the largest selection of engines ever contained in a fisheries exhibition."

## Shipyards

More than 20 shipyards will be represented. Winches, power blocks and other deck gear will be shown by at least 24 companies. Some 30 companies will be contributing to the wide-ranging displays of processing, packaging and refrigeration machinery.

The event has the support of the Aberdeen civic authorities, local and national fisheries organisations, the Herring Industry Board and the White Fish Authority.

Further information from Eagle Exhibition Consultants Ltd., Ludgate House, 110 Fleet St., London EC4A 3JL.

## Permanent display in Abu Dhabi

BRITISH products and services will be on permanent display in the Middle East when an exhibition in Abu Dhabi, United Arab Emirates, opens in April. Covering two floors at the new British Traders' Centre Building, the exhibition will be divided into consumer and industrial goods sections.

Exhibitors' products will be promoted by a full-time, British and native-speaking staff.

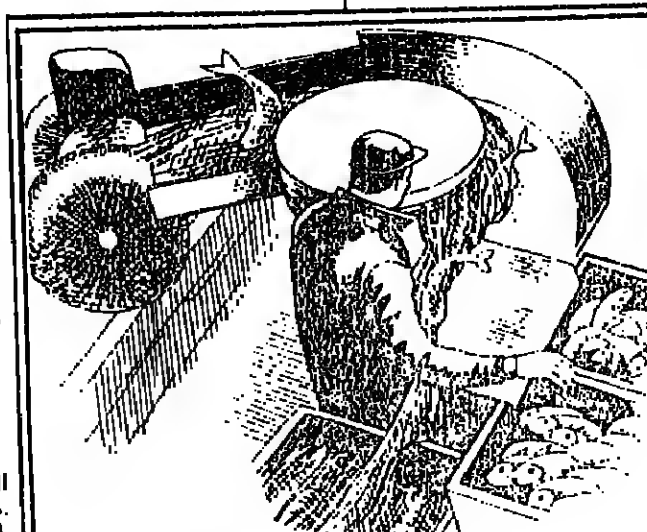
Further information from Industrial and Trade Fairs International Ltd., Sales Division, Radcliffe House, Blenheim Court, Solihull, West Midlands B91 2BG, England.

## CATCH to go

### European

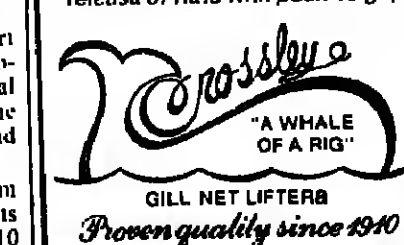
FOR THE 1979 showing of their highly successful CATCH series of fishery exhibitions, Eagle Exhibition Consultants are widening the scope and changing the venue.

This year it is back in Aberdeen, but in 1979 the exhibition will become EURO-CATCH and it will take place at the Olympia Exhibition Centre in London from June 27 to July 1.



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## Salmon in Chile

from page 19

If not, or if the young chum moved seaward much earlier or later, they would enter the northern limit of the divergence, and head for the tropics in the grip of the Humboldt Current.

Another possibility is that, if the young chum find enough feed in the plankton-rich waters of the archipelago, they would not be disposed to go to sea at all. But since chum tend to be among the most far-ranging of salmon species, this would not seem to be very likely.

If the chum do come back, the question, at least for the Japanese and Chilean biologists, may be moot. If they do not, and we are still seeking an oceanographic explanation. Then, perhaps, improved infra-red imagery from satellites can help us determine the extent of the seasonal movements of the divergence.

For the effort presently being undertaken by Union Carbide Corporation in Chile, the prognosis is also doubtful. The failure of the 1968-69 plantings of the same species (chum) in waters leading into the same Gulf of Ancud into which the Union Carbide fish will be released, should be enough to raise some doubts.

For releases this far north (42 deg. S), the Humboldt Current problem cannot

be overlooked. Nevertheless with coho there is a tendency for some hatchery stocks held captive beyond the normal time of release to remain as "resident" fish in interior salt waters close to the point of their release.

This behaviour could provide Union Carbide with some early returns. It certainly would not, however, offer much promise for the development of a substantial stock for commercial exploitation, as the saltwater feeding area would be limited. The same argument would hold for any non-sea-going stocks that might return to Aisen.

### Feeding grounds

For the successful introduction of a substantial salmon stock on which it might be possible to base a commercial fishery in the Southern Hemisphere, these extensive ocean feeding grounds. These would be rich in potential food organisms and characterised by a cool, equatorial, longshore current bounded offshore by a warm, poleward current that would repel salmon wandering too far seaward.

These conditions are found over the Patagonian Shelf, which would be

accessible, via the Falkland Current, in salmon released in Chile south of the divergence of the West Wind Drift.

It is worthwhile here to note that very similar conditions are found over the smaller Chatham Shelf off the east coast of New Zealand where, to date, the only successful transplants of true salmon into the Southern Hemisphere have been accomplished.

Introductions of salmon into Chile, therefore, should have the best chances for success if the fry are released into the channels and sounds of Magallanes in the far south. It appears that the most likely ocean feeding grounds for salmon near South America are in the Argentine economic zone.

Chileans can take heart, however, in that fresh water suitable for rearing young salmon seems to be much more abundant along the Chilean coast, and that it would be to these Chilean streams that salmon feeding over the Patagonian Shelf would be most likely to return. Officials in both countries should be encouraged to co-operate in the joint development of a South American salmon resource.

### U.K.

ADVERTISER would like to hear from any person or company engaged in experimental fishing for 200 plankton with view to purchasing from 10 to 500 kilos of the following species: Krill, Euchaeta, Calappa and Mysid Shrimp. Box No. 830.

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## Vacancies



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For the Latin American Regional Centre for Aquaculture being established in Pirassununga, State of Sao Paulo, Brazil.

The incumbent will be responsible for the organization of research teams for implementing systems-oriented research on selected production systems and will co-ordinate the overall research and training activities of the centre.

The incumbent should possess: University degree in biology, zoology, fisheries science or other related disciplines, preferably to the level of Doctor of Philosophy.

At least 10 years experience in planning and execution of aquaculture research preferably in developing countries.

Applications with detailed Curriculum Vitae, quoting the reference FID 309 should arrive at the following address not later than 31 March, 1978.

Personnel Officer, Fisheries Department, Food and Agriculture Organization, Via delle Terme di Caracalla, 00100 Rome, Italy.

## AUSTRALIAN MARITIME COLLEGE

# Senior Academic Staff

The AUSTRALIAN MARITIME COLLEGE is presently being established at Lismore, Lismore, an incorporated college of advanced education to provide maritime education and professional training courses for the maritime, fishing and associated industries, commencing at grade level. As the national college, it will be the only one of its kind in Australia. It is envisaged that the college will cooperate with the nearby College of Advanced Education and the Lismore College of Education in the provision of courses and the sharing of certain facilities, Lismore, with a population of 15,000, is the major centre for the north-east of New South Wales, and is linked with the mainland by a wide range of facilities and amenities, and has a pleasant, temperate climate.

It is anticipated that the following POSITIONS will be vacant by March 1978, in order that the new students can commence effectively the planning and initial development of the college.

### Head: Department of Nautical Science

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For particulars write to: The Maritime College, Lismore, New South Wales, 2480, Australia. Tel: Lismore 0661 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